Alternative Monetary Policies for Commodity Dependent Developing Countries: the myth of the exchange rate solution. A Post-Keynesian analysis of the Peruvian economic structure (1991-2010)

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Declaration for PhD thesis

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Abstract

This thesis addresses the issue of how monetary policy may influence non-financial firms' investment behaviour in a commodity dependent developing country. The Peruvian experience over the last two decades is particularly interesting because of the non-conventional exchange rate intervention implemented by the Banco Central del Peru since the beginning of the 1990s.

The thesis is organised in two parts. Part one critically reviews the evolution of the extensive theoretical literature on the "commodity trap" since the Prebisch and Singer hypothesis. It compares and contrasts the developmental effectiveness of two monetary policies alternatives to inflation targeting, namely Peg-Export-Price (PEP) target and the Real-Exchange-Rate (RER). It also shows how, however, these two alternative proposals overlook the issue of dollarisation. Second, part one also reviews the recent empirical literature on the financialisation of primary commodities and its effects on the cycle of commodity dependent developing countries. Part one concludes with sketching the theoretical framework of the thesis which relies on a Minskyian framework.

Part two illustrates the empirical findings of the thesis relative to the current monetary policy and its effects on a sample of 117 Peruvian firms. It concludes that the RER solution is not effective and that the PEP solution is not applicable. Part two also demonstrates how the current monetary policy favours firms which are more dollar exposed, namely domestic conglomerates and multinational corporations.

The thesis concludes that to escape the commodity trap, a change in the structure of the economy would be necessary; this would require a more active role of the central bank with respect to credit supply and in line with industrial policy. Nevertheless, the country's political economy conditions, such as the interests of the powerful conglomerates cannot be ignored.

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List of Acronyms and Abbreviations

ADR = American Depositary Receipt

BCRP = Banco Central de Reserva del Perú

CBME = Certificados Bancarios de Moneda Extranjera

CD = Certificate of deposit

CDDCs = Commodity Dependent Developing Countries

CFF = Compensatory Financial Facility

CONASEV = Comisión Nacional Supervisora de Empresas y Valores

CSF = Commodity Stabilisation Fund

GATT = General Agreement on Tariffs and Trade

GMM = Generalised Method of Moments

IMF = International Monetary Fund

INEI = Instituto Nacional de Estadística e Informática

IT = Inflation Targeting

MEC = Marginal Efficiency of Capital

NAIRU = Non-Accelerating Inflation Rate of Unemployment

PEP = Peg the Export Price

PEPI = Peg the Export Price Index

PPP = Purchasing Power Parity

RER = Real exchange rate

ROA = Return on Assets

STABEX = Compensatory Financial Facility and EU's Système de Stabilisation des Recettes d'Exportation (Stabex).

WDI = World Development Indicators

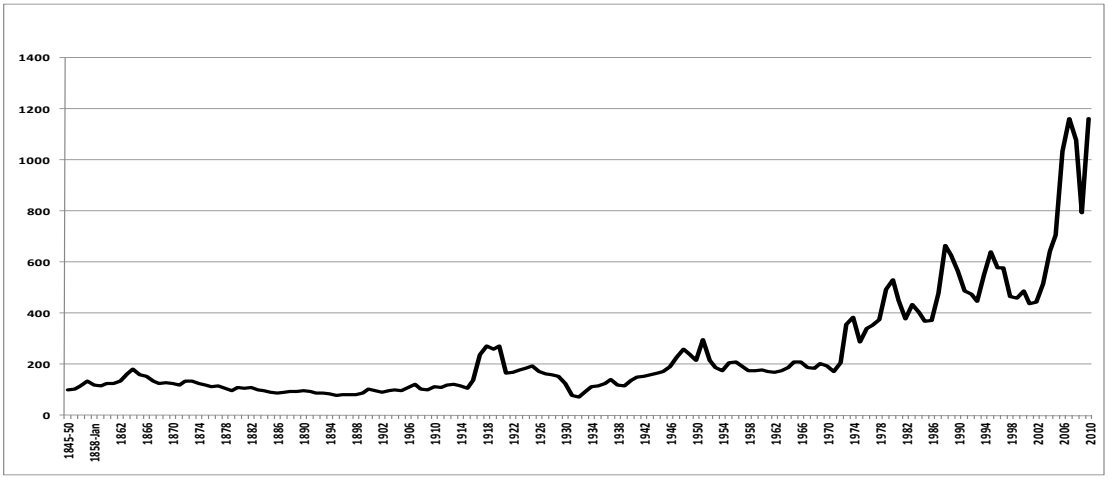
Chapter 1 – Introduction

1.1 Introduction and motivation

In early 2003, I was a "money manager", when I started to receive some telephone calls from my counterparties, the salesmen of the major banks, who wanted to sell a new product: they were referring to the derivatives on primary commodities.

Since those days, primary commodity prices have risen dramatically. Just to put some data into prospective Figure 1.1 shows the Economist price index (dollar based 1845-50 = 100).[1] During the four decades before WWI and the two decades prior to 1972, nominal prices were relatively stable. Movements in the index reflect various events: for example, the rise in cotton prices consequent to the shortfall in supplies caused by the US Civil War of the 1860s, the rapid rise in commodity prices during and just after the WWI and their sharp decline in the Great Depression, the rise during WWII, the upturn during the booms of the 1970s, and the rapid boom and slump periods during the 1980s and 1990s. The 2003-2008 boom is unique.

Figure 1.1: Nominal commodity price index (1845–2010)

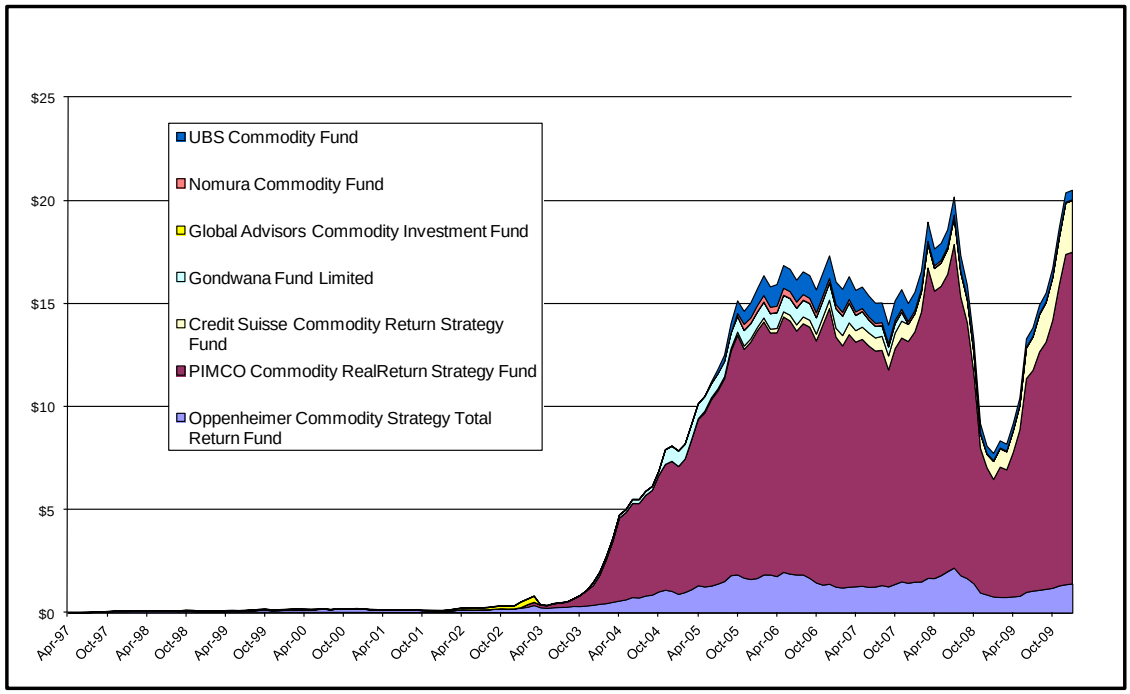


Source: The Economist (2011)

[1] The index contains 25 items, but excludes crude oil and precious metals. The weights for each commodity vary by year. However, for the year 2005, the Food components constitute about 55% of the index (15 items). Non-Food agriculture is about 15% (3 items). The Industrials are about 30% (7 items).

In order to explain this extraordinary boom one needs to consider the long-term evolution of capitalism since the Great Depression. Minsky labelled the first years after the Great Depression as "paternalistic capitalism": until WWII, the US government provided the main source of external financing. After this, because of changes in the financing structure and because of the privatisation of the US pension system, which released considerable amounts of funds to be managed privately, a new form of capitalism emerged. This was dubbed "money manager capitalism" (Minsky and Whalen, 1996). Figure 1.2 shows how money managers increasingly invested in primary commodity futures since 2003. Historically, primary commodity futures were used by producers and traders to hedge against price risk. However, since 2003, the primary commodity derivative market shows a clear dominance of money managers.

Figure 1.2: Sample of investment funds dedicated to the commodity market (Billion of US$) (1997-2010)



Source: Bloomberg (2011)

Commodity prices are crucial for commodity dependent developing countries (CDDCs). These countries are integrated into the international economy through primary products. Usually, small commodity dependent economies rely on undiversified productive structure and export basket. As a result, their business cycle is very volatile. Obviously, the smaller the country the more sensitive it is to external balance movements. The impact of commodity price volatility affects the economy at both micro and macroeconomic levels. Specifically, in term of monetary policy, CDDCs have to face two peculiar problems as a consequence of the fact that commodities are traded in US dollars. Firstly, their economies tend to be dollarised. Secondly, the exchange rate tends to be unstable because of the volatility of the price of the commodities exported.

Consequently, the exchange rate policy is supposed to play a key role in the macro-management of the economy since it can be a fundamental developmental instrument as proved, for example, by the late developers in East Asia (Chang, 2002; Wade, 2003). In the case of CDDCs, the exchange rate policy should aim to facilitate a diversification of the export sector away from the commodity dependence towards the non-traditional export sector.

Peru is a commodity dependent country: primary commodities form almost 70 percent of total exports of which 55 percent is metals (mainly Copper, 33 percent, and Gold, 18 percent), nine percent of agricultural (mostly fishing) and five percent of oil (WDI, 2011).

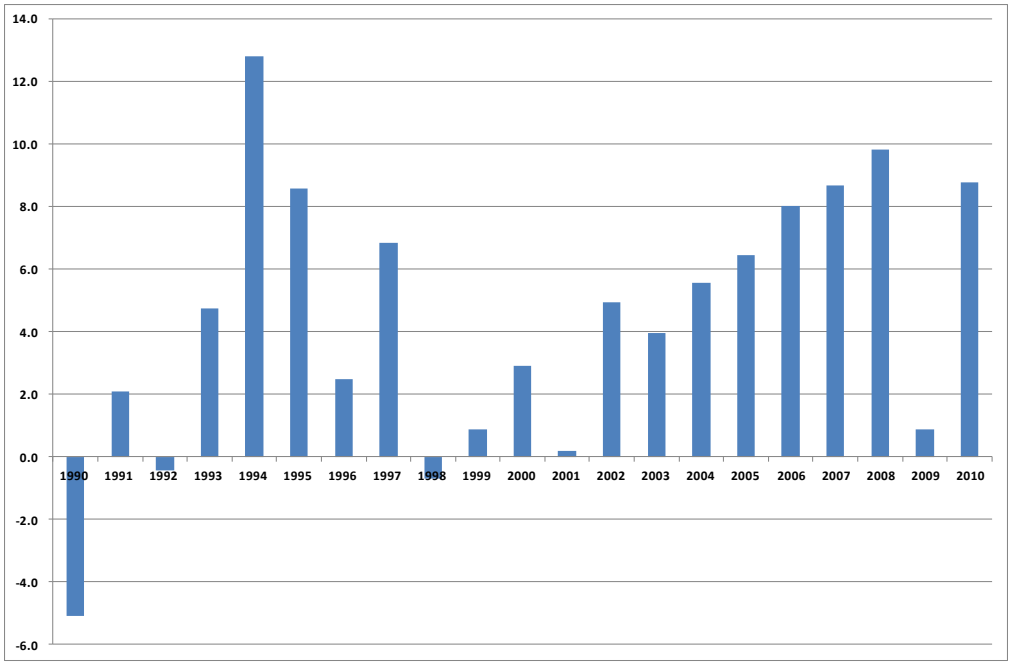
Peru's history is particularly rich in terms of exchange rate policy as it has implemented almost all possible exchange rate regimes. It adopted a floating system in the 1950s after a negative experience with a peg in the 1940s. A *de facto* fixed exchange rate started in 1954 when the central bank significantly increased its interventions in the foreign exchange market to keep the currency competitive. A deterioration of the balance of payments due to the term-of-trades decline caused a devaluation of 20 percent in 1958. A *de jure* peg was introduced in 1961 which lasted until a 44 percent devaluation in 1967. The crisis in the early 1970s induced a new devaluation with a switch to a crawling peg system in 1978 (when the real exchange rate depreciated by about 60 percent). This was kept until 1985 to maintain competitiveness. In order to fight inflation, Peru changed to a fixed exchange rate but, in July 1990, inflation reached 5,000 percent. Thus, in August 1990, the regime was changed to a dirty floating. In January 1993, a

new legal framework was introduced to sanction the independence of the central bank and make price stability its only objective.

Since the beginning of the 1990s, the smoothing of the nominal exchange rate through foreign exchange interventions keeps the real exchange rate fairly stable. This policy impedes sudden jumps around long-term trends: there has been a period of devaluation in the late 1990s because of the East Asian crisis, and a period of appreciation during the commodity boom phase (with the exception of 2009 because of the Great Recession).

However, besides its shifts in monetary policy, the Peruvian recent economic history is scattered with dramatic events as well: at the beginning of the 1990s, the economy was experiencing hyperinflation at 7,500 percent, the fiscal deficit was of about 7,8 percent of GDP and total external debt was 79 percent of GNI, growth rate was around -5.1 percent (WDI, 2011). The 1990s seemed to have brought a recovery: in 1997, inflation fell below 10 percent and was kept at around 2 percent until 2010; in 2007, the average annual growth rate, despite some volatility at the turn of the millennium, was of about 6 percent, and total external debt went down to 33 percent of GNI. In 1997, for the first time, Peru experienced a fiscal surplus of 0.2 percent of GDP and most importantly, saving went from 18 percent at the beginning of the 1990s to a 25 percent of GDP in 2007; in the same years, investment went from 16 percent of GDP to 23 percent of GDP (WDI, 2011). More recently, the country has benefited from the last commodity boom as shown in the Figure 1.3.

Figure 1.3: Peruvian real growth (percentage) (1990-2010)



Source: IMF (2011)

This background introduces the main objective of this thesis which is an investigation into the developmental role of the exchange rate in a CDDC. In this thesis, economic development is understood in terms of the process of moving from a set of assets based on primary products to one based on skills, technology and knowledge. To be more specific about this process and with respect to Latin America, it is necessary to refer to the significance of linkages from primary product exports to manufacturing and the quality of industrialisation under Import Substitution Industrialisation during the two world wars and Great Depression (Amsden, 2001). However, industrial policy should not be generally defined; it should be drawn from the specific economic conditions of the reality under consideration. A suggestion, in this sense, will be discussed in the last section of the concluding chapter.

The remainder of this chapter is divided into three sections. The second section will set out the main contributions and limitations of this thesis. The third section presents the research

questions, hypotheses and methodology. Finally, the fourth section presents the structure of the thesis and a short description of each chapter.

1.2 Thesis objective and possible limitations

The thesis attempts to make an original contribution to the existing literature in four ways. First, following the Post-Keynesian tradition, the thesis critically reviews the policy paradigm shift from Monetarists to New Keynesians. The originality stems from an application of the Post-Keynesian critique of these two models applied to the issue of dollarisation, which is typical of CDDCs. Furthermore, the thesis reviews two alternative exchange rate policies, namely Real Exchange Rate (RER) target and Peg the Export Price (PEP) target which are better designed for CDDCs. By representing them in equation forms, the thesis shows that they are very similar.

The second theoretical contribution stems from the review of the literature: mainstream economics adopts a simplistic definition of money; as a result, it is unable to address the complexity of dollarisation as part of the monetary system of the economy which limits the effectiveness of monetary policy. Accordingly, this thesis attempts to present an alternative analytical framework based on the Keynesian notions of liquidity preference and uncertainty. This is then adopted in the empirical part of the thesis where, thanks to an original graphic representation of liquidity, it is shown that, because of its narrow mandate, the Peruvian central bank did not implement any counter-cyclical monetary intervention either during the international financial crises of the late 1990s or during the Great Recession.

The third contribution is empirical: the Peruvian central bank has actively used the exchange rate irrespectively of the policy paradigm formally adopted. Foreign exchange interventions did not lead to any change in the structure of the economy. This result has to be read in conjunction with the highly concentrated structure of the Peruvian economy dominated by a few large conglomerates and foreign multinational corporations. These have shown no interest in investing in the non-traditional export sectors and are the only firms which can access international credit market.

The fourth contribution is methodological: the effects of financing conditions and exchange rate manipulations in shaping the structure of the economy are explored using a mixed-method analysis. The use of mixed-method studies is still very limited because of the positivist-deductive ontological basis and closed system of mainstream economics (Lawson, 1997). The use of mixed-methods and triangulation methods is consistent with the heterodox tradition in general. This thesis combines flow of funds analysis at macro level, interviews with policy makers, advanced panel data econometrics at micro level. It uses a database I compiled from balance sheet data and financial notes from the annual audited reports of 117 non-financial firms.

It is also important to mention three criticisms that could be raised against this study. First, this thesis suggests that the monetary problems of a CDDC may be overcome if the structure of the economy is diversified away from the primary commodity prevalence. This would imply the adoption of a pervasive industrial policy aimed at the development of non-traditional export sector. However, whether there are the political economy conditions for an industrial policy that should encourage such a diversification is an issue overlooked in this study. Rather, the thesis suggests that the Peruvian conglomerates may actually oppose a state intervention in this direction. In other words, even though the thesis seems to aim to a particular recommendation, it does not address the issue of whether this could be, in fact, adopted. This neglect is also reflected in the theoretical framework: a theory of the state in general and of policy formation in particular is not addressed. On the contrary, the overall aim is to present a case in open polemic with mainstream economic theory which supported two, only apparently different, monetary policy paradigms. These were unable to address the peculiarities of a CDDC.

Second, the thesis could be criticised for its partiality with respect to three aspects. Firstly, despite its critique of mainstream economics for separating fiscal and monetary policies, the thesis focuses only on the monetary side. Secondly, despite identifying different channels by which the real exchange rate can influence the economy, the labour channel is not taken into account in this thesis because of limited time and resources. This is a major issue since the focus of development is the increase of per capita GDP levels. However, the research focuses on the role of the financial channel in the structural change of the economy. Third, the literature review is, given the high numbers of works on the subject, necessarily incomplete. The works to review were chosen in order to tease out key elements that are then discussed in the rest of the thesis.

Lastly, on the methodological point of view, the rich contextual information provided comes at the cost of a potential loss of generality and replicability of the analysis to other countries. Moreover, even though the use of mixed-method triangulation has attempted to provide sound results, not all results have been triangulated: as a consequence, those results which were not triangulated are somehow weaker. However, the methods chosen for this thesis has been motivated by the author‘s understanding of economic reality as an open and complex system. Therefore, generalisations across objects and time are not given and depend on very specific preconditions. However, this issue does not prevent generalisations *per se*, but does involve a thorough and critical analysis of whether these preconditions are prevalent.

1.3 Research questions and hypotheses

This thesis was guided by two overarching research questions and relative hypotheses.

Research question 1 Since there has been a paradigm shift from monetary target to inflation target, the aim of the first research question is to identify what was the most effective paradigm in terms of development for a CDDC. This question reflects the idea that monetary consensus is designed for developed industrial countries, but it is implemented in developing countries too with, perhaps, some adaptations (see chapters 2 and 5).

- The first hypothesis related to this research question is that, since there was not actual shift in developed countries from monetarist to New Keynesian monetary policy, so there was not a paradigm shift in developing countries. I contribute to this Post-Keynesian general critique by showing how both paradigms dealt with dollarised economies (chapter 2).
- The second hypothesis corresponds to the first one but it is of an empirical nature: the Central Bank of Peru does not change its *de facto* policy despite a *de jure* change from the monetarist to the inflation target (chapter 5). In actual facts, the central bank tackles the issue of dollarisation by trying to stabilise the nominal exchange rate.

Following the first research question and relative hypotheses, a sub-question is set: since the exchange rate policy has an active role for partially dollarised economies, I ask whether there is an impact of the real exchange rate on the economy, or in other words, whether the changes in the economy are shaped through the channels by which the exchange rate should in theory operate. The hypothesis related to this question is that there is no change in terms of the finance channel.

Research question 2 The second research question follows from the first one. Since the inflation targeting (IT) is not being developed to deal with the issues of the CDDCs, the thesis poses the question of whether there is a valid alternative.

- The first hypothesis is that the RER target is preferred to the IT target from the theoretical point of view. The thesis shows that, theoretically, the RER target is preferred to the alternative PEP target: it may allow the diversification away from commodity dependence by stimulating the development of non-traditional export sectors because of its counter-cyclical nature (chapter 2).

Following the second research question and relative hypothesis, a sub-question is set. This focuses on the empirical application of the RER target. The hypothesis related is whether the stabilisation of the exchange rate implemented through foreign exchange interventions by the Peruvian central bank has an effect on the structure of the economy. This hypothesis is tested in chapter 6: there is no evidence that the structure of the economy changes and diversifies away from commodities.

- As a result, a further sub-hypothesis is conceptualised: the RER target is not successful in diversifying the economy because of the embedded/underlying structure of the economy. This hypothesis is tested by verifying who the beneficiaries of the exchange rate interventions are.

To conclude, the outcome of the first hypothesis is that RER target is preferred to PEP target. However, provided that the RER target appears to fail empirically, then it is worth testing whether the PEP target may be valid at least from the empirical point of view. This hypothesis is

rejected because the problems of the PEP target sketched out at theoretical level (chapter 2) are then verified in an empirical simulation (chapter 8).

1.4 Thesis Structure

Apart from this introduction, this thesis is divided into eight chapters.

Chapter 2 reviews the literature on commodity prices stabilisation in order to present the main problems which CDDCs have to face in macro-managing their business cycle. More specifically, in terms of monetary policy, this chapter critically reviews mainstream theory which is shown to be inadequate for CDDCs. I review both the monetarist and the New-Keynesian models adapted to partially dollarised economies. In particular, the IT framework amplifies the pro-cyclicality of CDDCs' business cycle since it is associated with a free floating exchange rate regime. I then review two alternative propositions: the RER target and PEP target.

Chapter 3 outlines an alternative analytical framework for the analysis of the business cycle of a CDDC and the transmission mechanism of monetary policy. To achieve this, the chapter clarifies two issues from the theoretical point of view. Firstly, a new theoretical framework is needed in order to explain the price fluctuations of the latest commodity boom. A Minskyan framework is adopted. Secondly, the chapter draws from the Post-Keynesian tradition to analyse the complex dimension of dollarisation, by defining two forms of liquidity to describe the monetary policy in partially dollarised economies. Finally, the chapter outlines the channels by which the real exchange rate can affect the economy. In particular, three channels are identified. Adapting Minsky's Financial Instability Hypothesis to CDDCs, this thesis focuses only on the finance channel determined by the effects of exchange rate fluctuations on firms' balance sheets.

Chapter 4 describes the approach and methods adopted in the following two empirical chapters. The chapter begins by explaining the method used to assess the structural transformation of the real and financial sectors in Peru discussed in chapter 5. This is the flow of funds analysis approach, a system of national accounts designed to bring the financial activities

of an economy into explicit relationship with one another and into direct relation to the non-financial activities that generate production and income (Board of Governors of Federal Reserve System 1975/1996). The second part of the chapter describes the mixed-method approach used to identify the effect of the Peruvian exchange rate policy on non-financial firms analysed in chapter 6. At first, the data on 117 non-financial firms is analysed by an advanced dynamic panel data econometric method, then they are elaborated through the creation of a database which allows investigating firms' capital structure and fragilities in a qualitative way following a set of categories.

Chapter 5 begins the empirical part of the thesis by contextualising the Peruvian monetary policy in historical terms with a particular focus on the issues of dollarisation and inflation stabilisation. The chapter shows how the Central Bank of Peru has followed the consensus on monetary policy shifting from the monetarists to the New Keynesian frameworks. Given the dramatic changes that the Peruvian economy had to experience throughout the period (i.e. hyperinflation, opening of trading and capital accounts, currency flights), the flow of funds analysis provides additional insight validating the theoretical conjectures derived in chapter 3. It follows that the Peruvian monetary policy can be explained applying the two forms of liquidity defined in the theoretical chapter.

Chapter 6 presents the empirical finding related to the effects of the Peruvian exchange rate policy for 177 listed non-financial firms. The chapter combines two types of analyses. First, it identifies the effects of both depreciations and appreciations of the Peruvian currency on firms' investments. Second, it presents a qualitative analysis derived by a database I created by investigating the firms' capital structure according to three types of categorisation of the data set: analysis of different activities by sectors, analysis of the tradables and non-tradables sectors, and analysis of different types of ownerships. In the last section, it follows an analysis of the structural development of the Peruvian economy during the entire period.

Chapter 7 closes the circle in terms of possible exchange rate solutions for CDDCs by simulating, for Peru, two exchange rate policies. Both Peg the Export Price (PEP) and the Peg the Export Price Index (PEPI) are analysed in both nominal and real terms. The disappointing

results, as anticipated in the literature review, lead to the re-assessment of the exchange rate as an actual developmental tool for commodity dependent countries.

Chapter 8 concludes with a summary of the findings, the theoretical and policy implications for the Peruvian economy and with avenues for future research.

Chapter 2 – Literature review on monetary policy for CDDCs

2.1 Introduction

This chapter presents a critical review of the issues related to the monetary policy of CDDCs with the aim of preparing the ground for the alternative theoretical framework presented in chapter 3 and the subsequent empirical part. The chapter shows that the issues around the monetary policy of CDDCs are various and complex, and, above all, are partially neglected by mainstream economic theory, whose inadequacy is discussed and some possible alternatives are presented.

Apart from this introduction, in the second section of the chapter, I will provide a brief historical introduction explaining how the ideas of stabilising commodity prices, and related instruments, have been overtaken, both in theory and in practice, by laissez faire policies. Today, the neglecting of the Keynesian counter-cyclical ideas leaves consumers and producers with the only possibility of hedging their risk in the derivatives market. As a consequence, a review of empirical studies is carried out in order to understand the behaviour of commodity prices since the break down of the Bretton Woods system and the abandonment of those policies which attempted an international stabilisation of commodity prices. Given that CDDCs may have a different basket of commodities to export, I will also focus on some studies aimed to determine whether raw commodity prices tend to follow the business cycle , regardless of their type (e.g. agricultural or metals), or they do not tend to co-move. This section leads to the conclusion that volatility of commodity prices has increased in the last decades accentuating, as a result, the issues of economic stability of CDDCs.

The third section moves to monetary policy. I will critically review the two mainstream paradigms, namely the monetary target and the inflation target frameworks which were successively adopted in Peru during the period under consideration. I will extend the Post-Keynesian critique of these two paradigms with respect of the issue of dollarisation.

The fourth section reviews two possible alternative solutions to the current IT monetary policy consensus framework, which will be proven not suited for CDDCs for its pro-cyclical

nature. The first solution is to manage the exchange rate counter-cyclically in order to stimulate the diversification of the export basket away from primary commodities. The second solution is proposed by Frankel (1999, 2003) who provides a way to peg the exchange rate in order to maintain commodity revenues constant throughout the business cycle, tempering the volatility of the cycle of CDDCs.

In the fifth section the above two alternative proposals will be compared in an original way through a series of equations. The section will show that the two solutions are similar in analytical terms; however, the proposal of managing the RER is preferred for its long-term developmental implications.

The sixth section will focus on the possible developmental role of the exchange rate for developing countries.

The final section will summarise the chapter, draw some conclusions and introduce the third chapter.

2.2 The debate on the instability of commodity prices since Keynes

Throughout the history of economic thought, different schools have covered the issue of commodity prices stabilisation: the main focus of the analysis has concentrated on trends and volatility of primary commodity prices and on the casual connection between price of exports and macroeconomic variables. The evolution of the literature on primary commodities is interlinked with the evolution of technical (mainly econometric) instruments and with the historical rise and dismantles of policies (various stabilisation measures and collapse of the Bretton Woods system).

This section is organised in terms of chronological evolution of the literature and corresponding policy prescriptions. The discussion starts with the debate between Keynes and Hayek and various proposed instruments; it then moves to Prebisch and Singer and to the empirical studies on the declining terms-of-trade. The collapse of the Bretton Woods system

introduces the literature on volatility, and finally the investigation on the relation between primary commodity prices and macro variables leads to the inquiry into the business cycle.

The issue of stabilising commodity prices originated in fierce debates around policy including between Keynes (1938) and Hayek (1943):

"...the fluctuations in the prices of the principal raw materials which are produced and marketed in conditions of unrestricted competition are quite staggering...My proposal is, therefore, that the Government should offer storage to all Empire producers of specified raw materials, either free of warehouse charges and interest or for a nominal charge, provided they ship their surplus produce to approved warehouses in this country. The Government would not become the outright owners of the stocks in question, which would remain in the ownership of the depositors, who would run the risk of price changes and would be free to remove and dispose of the stocks at any time or to deal in them against warehouse warrants." (Keynes, 1938, p.450)

Shortly thereafter, Hayek concentrated on the monetary implications of commodity prices fluctuations in "A Commodity Reserve Currency", followed by Keynes' reply, "The Objective of International Price Stability" on the same issue of the Economic Journal (Jun-Sept, 1943). From opposite perspectives, both studies promoted international cooperation to coordinate international demand and supply. Keynes was pro-government intervention while Hayek had in mind an alternative to the Gold Standard inspired by the famous Wall Street investor Graham (1941). Hayek writes:

"The basic idea is that currency should be issued solely in exchange against a fixed combination of warehouse warrants for a number of storable raw commodities, and be redeemable in the same "commodity unit"...With this system in operation an increase in the demand for liquid assets would lead to the accumulation of stocks of raw commodities of the most general usefulness. The hoarding of money, instead of causing resources to run to waste, would act as if it were an order to keep raw commodities for the hoarder's account. And as the hoarded money was again returned to circulation and demand for commodities increased, these stocks would be released to satisfy the new demand". (Hayek, 1943, p.173)

Since the first studies, heterodox economists after Keynes concentrated on various proposals such as buffer stocks, export restrictions and multilateral agreements aimed at the stabilisation of either prices or quantities of primary commodities. These recommendations were based on the idea of transferring the risk of price changes from producers and consumers to governments.

Several instruments of commodity prices stabilisation policy were implemented throughout history.

Buffer Stocks refer to the institutional buying and storing of commodities during production surplus, and selling in case of shortages. A buffer stock can be applied to one commodity or to a basket of commodities. Typically, governments or marketing boards store or incentivise the storing. The more general proposition of using a basket of commodities to stabilise output and prices as a whole was set forth by Graham (1941; 1944): that the surpluses of goods, which should be regarded as greater wealth, could cause so much damage in the Great Depression was perceived as paradoxical. However, mainstream economists opposed the use of buffer stocks arguing that the operational costs was higher than the use of monetary reserves, and the accumulation of quantity output unused by the market disrupted the functioning of the market and induced moral hazard.

Reserve Currency Graham (1944) also supported the creation of a commodity reserve currency. This would work effectively like a Gold Standard. However, the backing up currency would not be a single volatile commodity, e.g. gold; rather, an entire basket of commodities. Gold and money fluctuate in their purchasing power of staple commodities. The "gold reserves" which previously determined the supply of money in the Gold Standard would be replaced with the very "commodity reserves" of the ever-normal granary, thus anchoring the money supply to real purchasing power, impervious to political manipulation (as in the modern system) and far more stable than a single commodity (as in the Gold Standard). This idea was resumed by Kaldor et al. (1964) in the 1960s and especially after the break of Bretton Woods. Recently, Hall (1982) and Yeager (1983) have continued to propose various aspects of Graham's scheme and the recent resurgence of interest in "sound money" and economic stability, particularly in light of the East Asian crises of 1997-8.

Export Restrictions Commodity prices are stabilised through the control of quantity marketed by production or export quotas. The risk is taken on by individual countries rather than by an international institution. All major producers and consumers need to comply with the scheme in order to discourage outside or extra-quotas producers to take advantage of it. Mainstream economics has always shown little sympathy for these measures and since the trade policies enforced by General Agreement on Tariffs and Trade (GATT), countries shifted from quotas to tariffs.

International Agreements Multilateral contracts specify a maximum price at which producing countries are obliged to sell stipulated quantity to consuming countries and minimum price at which consuming countries are obliged to buy those quantities. International Commodity Agreements (ICAs) have been attempted since the collapse of commodity prices during the great depression in the 1920s. The Second World War made economists and politicians of developed countries aware of their vulnerability in terms of supply of primary commodities. Several international commodity agreements have been signed since then, for both temperate zone and tropical products in an attempt to moderate the perceived power of the producing countries. Today ICAs are not *en vogue*: the need for considerable start-up capital and for the existence of "normal" market conditions at the outset, built-in flexibility to deal with changes in market requirements, the chances of being outwitted by the market if the target prices are not credible, difficulties over the choice of currencies to denominate target prices and the need to control the agreement determine their unfeasibility.

Contingency Financing: IMF's Compensatory Financial Facility and EU's Système de Stabilisation des Recettes d'Exportation (Stabex). The Compensatory Financial Facility (CFF) was established in 1963 by the International Monetary Fund to facilitate countries affected by temporary exogenous shocks, but from 1983 the access limit has been reduced. Stabex was established by the European commission in 1973, but abolished in 2000.

Besides the above mechanisms, a more radical solution for countries producing primary commodities was derived by the famous Prebisch-Singer hypothesis (for example, Prebisch, 1950). This was based on the empirical findings that the prices of primary commodities relative to manufacturing goods tend to decrease over time with consequent loss of income. The resulting

policy implications suggested import-substitution industrialisation: *"Import substitution is the only way to correct the effects on peripheral growth of disparities in foreign trade"* (Prebisch, 1959, p253). In a nutshell, developing countries had to move away from the prevalent production of primary commodities and diversify their productive structure.

However, since the gradual dismantle of the stabilisation policies, following the break of the Bretton Woods system, additional empirical studies have attempted to find further evidence in support of commodity secular trends and various price patterns: the Prebisch-Singer hypothesis has been tested by a number of studies where extra analytical complexity has been added by including more sophisticated data and new econometric techniques. However, the overall result has been controversial. For example, Grilli and Yang (1988) worked extensively on the quality of data by extending the study to 1900 non-fuel primary products, and found that prices decline relatively to manufacturing goods sold in the United States and exported by other industrialised countries. On the contrary, with the development of unit roots tests and inclusion of structural breaks, more recent studies, based on the indexes generated by Grilli and Yang (1988), failed to detect the trend. Cuddington and Urzua (1989) identified a structural break only after 1920 and found no evidence of a downward trend in relative prices. Hadass and Williamson (2001) estimated the terms of trade for 19 developing and industrialised countries, between 1870 and 1940: the difference in the performance between core and peripheral countries appeared to be true, but not due to the terms-of trade; rather it was the result of the asymmetric impact of quasi-permanent price shocks. This orthodox literature subscribed to the idea that stabilisation policies are not necessary, and that, in any case, the effectiveness of stabilisation funds depends on whether shocks are permanent or not: stabilisation policies can only be effective in the short-term.

Therefore, since Prebisch and Singer, much of the empirical debate has developed on whether the non-stationarity of real commodity prices takes the form of a deterministic trend, or there are structural breaks in the trend. Spraos (1980) noted that the trend is very sensitive to the choice of time period, and when the original series used in Prebisch (1950) is prolonged beyond 1950, the downward trend of the periphery's terms of trade disappears. The controversy about the declining terms of trade remains still unresolved. However, over the last 140 years, it seems that real primary commodity prices have declined of about one percent per year. They followed a non

smooth process with occasional changes by as much as 50 percent per year (Cashin and McDermott, 2002). Consequently, the literature has concentrated more on volatility.

In the literature, volatility tends to be associated with business cycle fluctuations: a more recent stream of studies focused on the cyclical behaviour of commodity prices. Cuddington (1992) and Reinhart and Wickham (1994) studied the duration and persistence of commodity-price cycles. They applied the decomposition technique developed by Beveridge-Nelson that defines the terms of deviation of the series from trend. This is an alternative to the classical cycle approach (Watson 1994), which deals with data levels, hence avoiding the subjective choice of which de-trending method to use. Price booms (slumps) are so described as period of absolute increase (decrease), not as periods of above-trend (below-trend) growth in the series. According to Cashin and McDermott (2002), who have used the classical approach, there have been 18 completed cycles from 1862 to 1999, where a cycle includes one boom and one slump. The observation is that: "*the amplitude of price movements increased in the early 1900s, while the frequency of large price movements increased after the collapse of the Bretton Woods regime*" (Cashin and McDermott, 2002, p.175).

The relevance of commodity prices for the business cycle of a country has been revealed by Bidarkota and Crucini (1999). Blattman et al. (2004) examined the price behaviour of 42 commodities and found that the most important feature over 70 years (1870-1939) is not the long-term drift, but their volatility. In fact, volatility across products varies by more than a factor of ten. Commodity prices experienced the highest average growth and lowest volatility from 1890 to 1909, and the highest volatility and slowest growth during the interwar years. In addition, within each period, some primary products were very volatile (such as tobacco and coffee), while others were more stable (such as iron and wheat). Furthermore, while some commodity prices rose (such as tobacco and wool), others decreased (such as rubber, which was supplanted by cheaper synthetics in the interwar period). Other researchers have analysed whether, with different volatility, commodity prices co-move within the same business cycle (Bidarkota and Crucini, 1999).

Accordingly, orthodox theory concentrated on how current and expected values of macroeconomic variables such as inflation, industrial production, and interest rates affect current

and future demands and supply of all commodities. For example, higher interest rates should decrease real commodity prices if one considers the convenience yield[2] from holding inventory relative to treasury yield. In addition, speculators are encouraged to allocate away from commodities to treasury bills (Frankel, 2006). Pindyck and Rotemberg (1990) tried to verify whether the co-movement of commodity prices could be explained by macroeconomic variables or there were excess movements due to inefficient commodity market structure (i.e. herding behaviours of commodity traders).[3] They run a correlation analysis of prices of commodities which are supposed to be the least related for the period 1960-85.[4] This means that they cannot be substitutes or complements, or not co-produced or used as major input for the production of another commodity.[5] While Pindyck and Rotemberg (1990) found that prices tend to move together despite macro considerations, Deb et al. (1996) reached an opposite conclusion. Cashin et al. (1999) joined the debate using a different measure of co-movement, "concordance", which measures the proportion of time when the prices of two commodities are synchronized in the same boom or bust period. The result, based on an extended period of time (1957-99), shows co-movements only for oil and gold which may be explainable by the desire to hold gold during inflationary periods.

However, the existence of co-movements is not a clear phenomenon as orthodox would argue: volatility gets dispersed in various types of commodities. For example, today, market investors know that agricultural commodities have a lower beta than energy commodities relative to market composite index because agricultural commodities are less durable.[6]

In conclusion, attempts to stabilise primary commodity prices came to a halt with the collapse of Bretton Woods. Higher commodity price volatility since the 1970s was due to the closing down of domestic marketing boards and the ending of international commodity

[2] The convenience yield was introduced by Kaldor (1939, p.6): *"The yield of stocks of raw materials…consists of "convenience", the possibility of making use of them the moment they are wanted"*.
[3] This case then represents a rejection of the standard market clearing competitive storage model of Samuelson (1971).
[4] These are: wheat, cotton, copper, gold, crude oil, lumber and cocoa.
[5] *"Examples of joint production include coffee and cocoa in Cote d'Ivoire, copper and lead in the former Soviet Union and substitution between wheat (beet) sugar, cotton and maize in agricultural production in many parts of the world. An example of joint consumption includes copper, zinc, gold and lead to produce metallic alloys"* (Deb et al., 1996, p. 280).
[6] In finance, the beta of a stock in a portfolio is defined as a number describing the volatility of that asset relatively to the volatility of the benchmark.

agreements during the 1980s and 1990s (Maizel, 1997). With the end of stabilisation measures, producers and consumers were left with the only option of hedging against price fluctuations through the use of derivatives, mainly futures.

2.3 Shifts in the monetary policy paradigm with reference to a partially dollarised economy

The previous section highlighted, more or less implicitly, how the evolution of the literature on primary commodity prices was affected by changes in policy such as the collapse of Bretton Woods or the removal of marketing boards while, relatively little attention has been dedicated to monetary policy in CDDCs. As a result, a number of issues have been neglected. Among these, it is the issue of dollarisation, which this section deals with.

Generally, the literature has extensively debated the effectiveness of monetary policy within a closed economy context with only one currency in circulation and a developed financial system typical of industrialised countries.

However, the persistence of inflation in the 1970s created an opportunity to revitalise the idea of the quantity theory of money which allowed Friedman to found the "new monetarism". This was based on a series of econometric studies (for example, Friedman, 1959) aimed at proving the close correlation between money supply and income money. Thus, it was argued that, in order to stabilise the economy and avoid inflation, it is crucial to secure a steady growth in the money supply, not a steady rate of interest.

However, the short-lived implementation of the monetarist measures to control credit in the USA and in the UK (e.g. Monetary Control Act 1980 in the USA) were rapidly abandoned and followed by a return to a traditional policy of regulating interest rates (Kaldor, 1982). Nevertheless, the breakthrough of the new monetarists in the International Financial Institutions informed policy recommendations to developing countries: targeting money growth became the monetary approach enforced in the stabilisation programmes until the 1990s, when the New Keynesian inflation targeting regime was introduced.

However, most developing countries have to face the problem of dollarisation, which is even more evident in case of CDDCs since primary commodities are priced and traded in dollars. By the 1970s, emerging countries were flushed with dollars borrowed from western banks and dollarisation has never disappeared since. Actually, in Peru (chapter 5), dollarisation tends to increase in periods of crisis.

Despite the dominant role of dollarisation in many countries, this section surprisingly reveals that within mainstream theory, of both Monetarists and New Keynesians, there has been no real effort to formulate or redefine a monetary theory with a dual-money or dual-currency economy.

Famously, a Post-Keynesian critique of both New Keynesians and Monetarists argues that their understanding of monetary phenomena is based on an incorrect interpretation of Keynes which originated the neoclassical synthesis framework. This section contributed to this critique with respect to dollarisation. Indeed, this phenomenon is interpreted just as an additional exogenous element of the monetary system not contemplated in the basic case of a closed developed economy. Therefore, the conventional wisdom is that central banks can conduct an independent monetary policy even in a partially dollarised economy.

Thus, the aim of this section is to demonstrate that, despite the change in monetary policy consensus, from the monetarist monetary target to the New Keynesian inflation target implemented since the 1990s, in reality central banks still have only one option to ameliorate the disturbing effects caused by dollarisation in conducting their policies: given the constraints imposed by a partially dollarised economy, they can only smooth exchange rate volatility. This mainly follows from their theoretical and institutional framework. Post-Keynesians argue that both monetary targeting and inflation targeting frameworks are theoretically weak. This section contributes to reach a similar conclusion for the specific case of partially dollarised economies.

The structure of this section is the following. In the first two sub-sections, I will review both monetarist and New Keynesian monetary models and introduce the corresponding Post-Keynesian critique. This review is necessary because Peru experienced the monetary paradigm shift from the monetary target to the IT target (chapter 5). In the third sub-section, I will review

theories on dollarisation. Again, Peru had to deal with dollarisation since the adoption of the monetarist model (chapter 5). The fourth sub-section is a critique of such interpretations of dollarisation which leads to the conclusion that Monetarists and New Keynesians conceptualise dollarisation in very similar ways and neglect its complexity. However, in the theoretical chapter, I will show that Post-Keynesians offer a framework to develop an alternative perspective which provides a different understanding of the issues in relation to macro stabilisation in a partially dollarised economy.

2.3.1 The essence of the monetarist model and the Post-Keynesian critique

The monetarist model

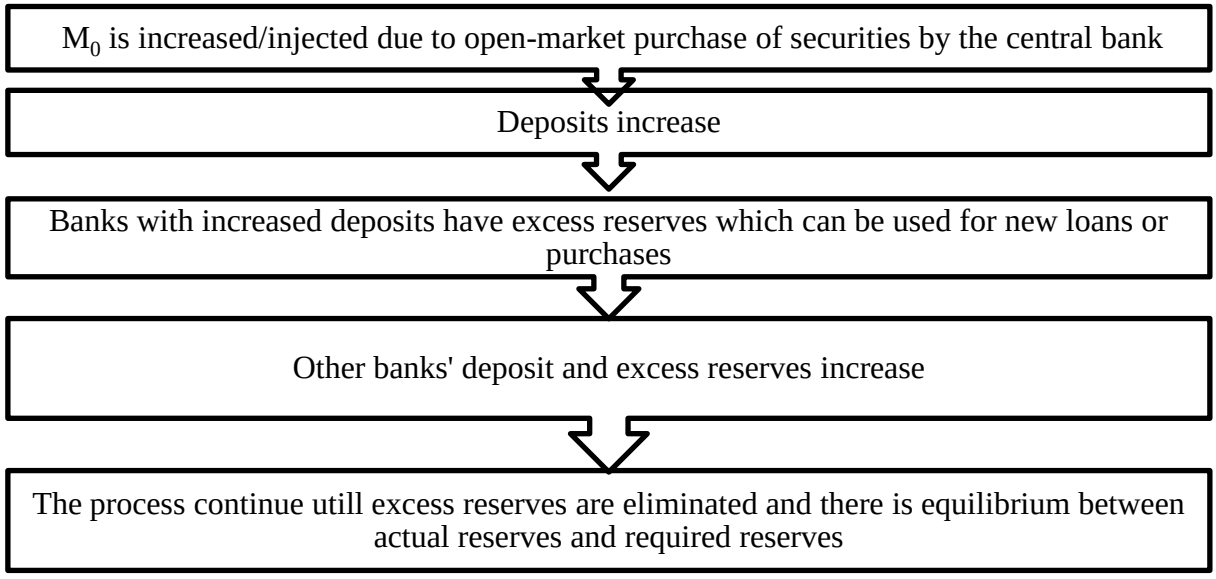
The monetarist basic model presents two well known versions. The Pigou (1917) version shows the classical mechanism of "direct effect" by which the money supply directly affects private sector spending where money supply is assumed to be exogenous ($M^S = \bar{M}$). Money demand is proportionate to money income which is given by the Cambridge equation ($M^D = kY$). The direct relationship is derived by the assumption that 1/k, the velocity of money, is constant since payment arrangements are mainly determined by institutional and social habits which tend to change very slowly. Therefore, the money market is in equilibrium if $\bar{M} = kY$; that is, if money supply changes, then income needs to change to return to equilibrium. The causality is determined by the assumption of exogeneity of the money supply.

The other version of the quantity theory of money is the Fisher (1911) equation MV=PT. Here, the assumption is that in equilibrium output is constant given the flexibility of wages and prices which guarantee full employment of resources. Then, if both V and T are considered approximately constant, which means a stable money demand, the above equation links money to price and not to output levels, this means that money supply determines inflation.

Within this monetarist model, the government is supposed to control money supply through the monetary base M_0. The control of money supply is determined by the link between bank deposits, which are liabilities of commercial banks to their customers, and bank reserves,

which are assets of commercial banks and liabilities of the central bank. This link is the money multiplier. Thus, the transmission mechanism of the monetary policy during a monetary expansion can be represented by the following flow diagram (Figure 2.1).

Figure 2.1: Transmission mechanism of monetary policy according to Monetarists



The central bank can influence the money multiplier by either determining the minimum reserve requirement (rr) at the central bank, or by changing the monetary base M_0, assuming that the excess bank reserves are small and constant over time, and that the public's preference of currency over deposit (cc) does not change (equation 1).[7]

$$\frac{M_1}{M_o} = m = \frac{1}{cc+rr(1-cc)} \qquad (1)$$

[7] The multiplier equation is given by the combination of two definitions. M_0, the monetary base, is the sum of two components: 1. C_P is the currency in the hands of public indicated as part of the money aggregate ccM, and 2. $C_B$are bank reserves which are the sum of required reserves rrD, which are part of the deposits, and excess reserves.

Thus $M_o = C_P + C_B = ccM + rrD +$ excess reseves (2)

M is the sum of two parts: M= C_P+D= ccM +D (3)

The standard textbook explanation of monetary policy effectiveness is based on the IS-LM model (Hicks, 1937). The two schedules define the equilibrium of the whole economy, but each of them is assigned to a particular policy: the LM schedule defines the equilibrium of the money market and it is influenced by monetary policy; the IS schedule defines the equilibrium of the goods market and it is influenced by fiscal policy.

The Post-Keynesian critique of money growth targeting

This Post-Keynesian critique is associated with a different idea of the nature of money according to which, money is endogenously determined within the economic system.

First, the Post-Keynesian approach is based on a complex link between money, credit and finance. The development of financial institutions depends on the evolution of the characteristic of money, since *"in a modern capitalist economy the institution of money is inextricably tied to the institution of banking"* (Minsky 1986a, p.346). Thus, money has to be contextualised: it *"can only be studied in an historical and institutional context"* (Davidson, 1982, p.241). For this reason, Post-Keynesians refuse to adopt a particular model which *"can solve all economic problems for all times and circumstances"* (ibid, p.8).

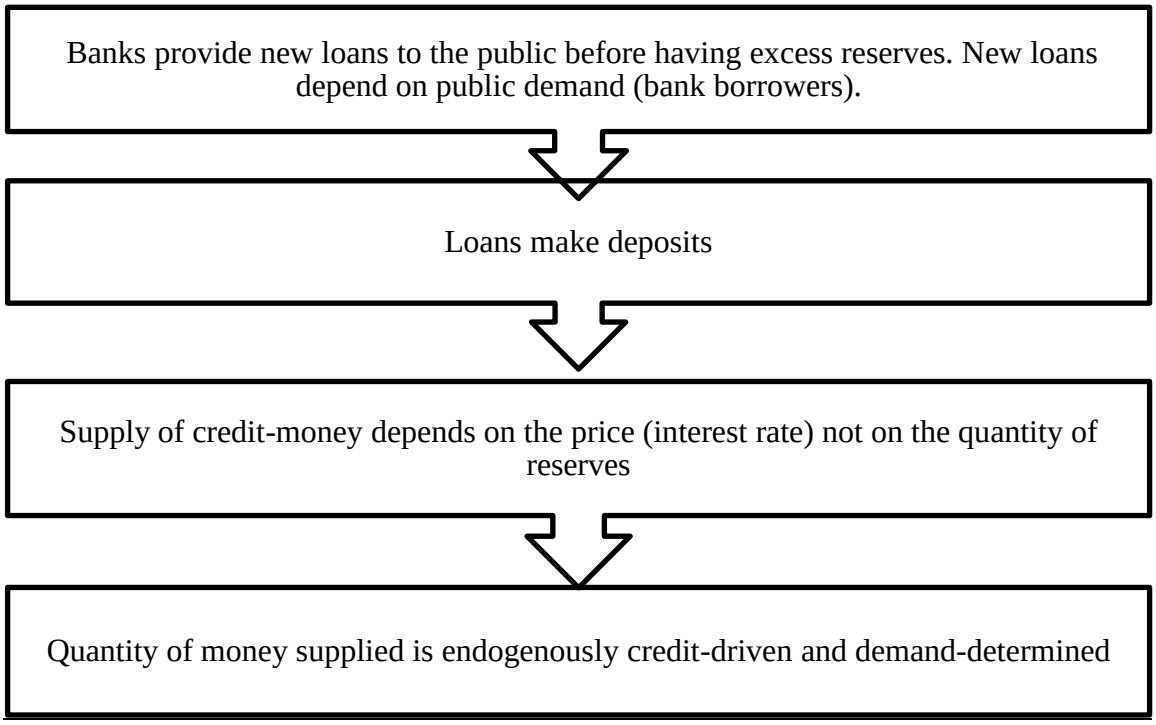
Second, the economic system shows three essential characteristics: the existence of uncertainty, the existence of irreversible time (production takes time and agents commit well before the outcome can be predicted) and the existence of contracts denominated in money which bind agents (money and contracts are related), as money is *"a link between the present and the future"* (Keynes, 1997, p.294).

Third, and as a result of both points above, in such a dynamic production system, money can be introduced in three possible ways. First, because of the production process itself, credit is indispensable; consequently the analysis of credit-granting institutions is extremely important. Second, money can be introduced into the system by fiscal and open market operations by the monetary authorities. Third, money can be created or destroyed because of overseas flows (Arestis, 1988). For example, within an open economy model, the degree of openness and the

exchange rate regimes are important factors for demand and supply of finance and money (Dow, 1987).

As a result of this conceptualisation of money, the Post-Keynesian transmission mechanism goes in the opposite direction compared to the monetarist one (Kaldor, 1982; Moore, 1988b), see Figure 2.2.

Figure 2.2: Transmission mechanism of monetary policy according to Post-Keynesians



Therefore, the origin of money supply is in the banks: "*banks are in the business of selling credit*" (Moore, 1988a, p. 49); *"banks create credit money whenever they extend loans"* (ibid, p.xii); *"loans constitute the majority of money"* (Arestis, 1988, p. 63).

In addition, as opposed to the monetarist unidimensional approach, Post-Keynesians deal with the complexity and various shapes of money as *"bank credit should be viewed as a package of loan terms, to emphasise the multidimensional nature of loan contracts"* (p. 25, Moore, 1988a). This is particularly clear with respect to inflation: *"Monetarists do not recognise the distinction between demand- and cost- inflation. They argue rather that costs are derived from*

prices, and prices rise due to excess demand in some or all markets as a result of an excess supply of money balance" (Moore, 1988a, p.123). For Monetarists, inflation is just the result of *"too much money chasing too few goods"*, which, again, is the result of their simplistic definition of a commodity/fiat money economy, overlooking the *"promise to pay fiat money"* (ibid, p.19, my emphasis).

This simplistic approach to money presents at least two problems in policy terms especially for CDDCs, namely the choice of which monetary target to stabilise and which instrument the monetary authority should control. The lack of distinction between credit-money and commodity-money implies the selection of the wrong instrument in practice *"...even when a precise definition of the money supply was chosen...there was the largely unforeseen difficulty of regulating the movement of this chosen magnitude by the habitual instruments of central banking policy"* (Kaldor, 1982, p. xii).

Second, with respect to the control of money supply, Post-Keynesians have identified an asymmetry between money-creation and money-destruction: the central bank can easily increase the monetary base by open market purchases. However, the opposite is not as easy since banks do not always have marketable securities to sell. Banks' portfolio composition is made up of marketable and non-marketable assets. Generally, bank loans may be illiquid, non-tradable in the secondary market, and made at the initiative of the borrower (i.e. they are demand-determined). Thus, if banks have liquidity problems they can refer to the central bank which retains its duty of lender of last resort. As a result, the central bank cannot restrict the growth of money nor can it control outstanding stock of credit. It can only rise *"the minimum supply price at which it stands ready to supply reserves necessary to guarantee system liquidity"* (Moore, 1988a, p.109).

However, the central bank control over money was further limited since the historical transformation of banks started in the 1960s: liability management allows banks to finance new loans by issuing Certificate of Deposits (CDs), both domestically and in the Eurodollar market, or selling securities under repurchase agreements (Repos) which are not controllable by the central bank. Crucially, then, not even the cash component of money can be controlled; the supply of additional cash cannot influence its distribution between banks and the public. Even admitting, as the neoclassical synthesis suggests, that it is possible to exercise a strict control of

the monetary base, changes in this aggregate can cause massive movements of the interest rate which may cause structural changes in the financial system making the money multiplier unstable (Kaldor, 1982; Moore, 1988b).

Third, Post-Keynesians maintain that the IS-LM model is based on an inappropriate interpretation of Keynes (Minsky, 1986a). Keynes used the quantity theory of money only as a way to explain the idea of liquidity preference. The neoclassical synthesis neglects the role of financial institutions: *"the elements of Keynes that are ignored in the neoclassical synthesis are...the special properties of economies with capitalist financial institutions...The neoclassical synthesis emphasizes equilibrium and equilibrating tendencies, whereas Keynes's theory revolves around bankers and business making deals on Wall Street"* (Minsky, 1986a, p.103).

Furthermore, the neoclassical framework misses some fundamental dynamics: first, the rigid separation between monetary and fiscal policy does not allow the inclusion of the dynamic inter-relationship between both policies. In this case, there is no "fudged" solution. Second, it cannot cope with price changes. The problem has been "fudged" by expressing the demand for money function in real terms (a rise of nominal money supply at full employment cause the price level to rise causing no shift of the LM curve in real terms). So, changes in nominal money have no effect on real output, but only on prices, as for the classical dichotomy. However, there is no theory behind the *a priori* division between price and output. Third, it ignores the fundamental role of changes in expectations (Chick, 1973).

The static character of the neoclassical synthesis and the neglect of the role of expectations are criticisms shared by New Keynesians. The New Keynesian model is where we turn now.

2.3.2 The inflation target model and the Post-Keynesian critique

<u>The model</u>

Stemming from the difficulty in implementing a monetary target regime, a new consensus guided by New Keynesians emerged (i.e. Svensson, 1998; Taylor, 1993; Woodford 1998).

In a nutshell, the new synthesis based on the New Normative Macroeconomics (Taylor, 1993; Clarida et al. 1997), maintains that monetary policy is implemented by changes in interest rate which, given the assumption of nominal price rigidities, are non-neutral. Its theoretical foundation is a new interpretation of the IS-LM framework which differs from the traditional one because of its micro foundations in which aggregate variables are derived from the private sector optimising behaviour. This is determined by rational expectations, the introduction of which makes the credibility of the central bank an important issue (Romer, 2000).

Furthermore, the perceived failure of the traditional fixed-prices IS-LM model in dealing with the 1970s inflation led to the inclusion in the model of the aggregate supply (AS) schedule. In the new IS-LM-AS model, higher output brings higher inflation through firm's mark-up directly or through wages indirectly (i.e. inflation is demand-pull). Therefore, the new-consensus model can be summarised by three New Keynesian equations, where LM is replaced by MP (Monetary Policy), in its simplest formulation (Romer, 2000).

The first equation defines the aggregate demand or the IS relationship. In the simplest formulation used by Allsopp and Vines (2000), the current output is negatively related to the real rate of interest where y_o covers all autonomous growth components:

$$y = y_o - \beta r + u \qquad \text{(4a) (IS equation)}$$

In the more sophisticated version of Goodhart (2006), E is the expectations operator:

$$\tilde{y} = y - y^* = f(E\tilde{y}, r - E\pi) + u \qquad \text{(4b) (IS equation)}$$

where $\tilde{y}$ is the output gap, y is current real output, y* is the natural, or equilibrium, or sustainable level of output, r is the nominal interest rate, π is the rate of inflation and u is the error term.

The second equation is the aggregate supply or price equation. As mentioned above, the aggregate supply equations evolve directly from the optimising behaviour of households and

firms, thus current economic behaviour depends crucially on economic agents' expectations. The formulation was derived by Calvo (1983), moving away from the traditional Keynesian sticky price definition:

$$d\pi/dt = f(E\pi, \tilde{y}) + v \qquad (5)\ (\text{AS equation})$$

The aggregate supply equation (5) shows that there is a positive change in inflation when the output gap increases. Nominal prices are considered not completely flexible given, for example, the inclusion of imperfect information (Stiglitz and Greenwald, 2003). When prices remain persistently high the equation is still valid and the output gap is closed thanks to the inclusion of forward-looking expectations (Romer, 2000). In actual fact, this is a variant of the expectations-augmented Phillips curve (Lavoie and Seccareccia, 2004).

The last equation (Equation 6) describes the central bank's reaction function (Taylor, 1993) in which the interest rate is adjusted with reference to the output gap and the difference between the inflation rate and its target:

$$r = r_o + b\,(\pi - \pi^*) + c\,\tilde{y} \qquad (6)\ (\text{MP Equation})$$

where π^* is the target inflation rate.

Overall, the model can be graphically represented in a way similar to the standard IS-LM representation (Romer, 2000). It is a fully recursive model, inflation is inherited from the past and determines real interest rates, which, in turn, determine output. The output gap determines next period inflation (Lavoie and Seccareccia, 2004).

In reality, central banks use more sophisticated models that include expectations and lags. When applied to small open economies, these models consider trade, capital flows and the effects of the real exchange rate by inserting additional assumptions: for example, the law of one price holds and the interest rate spread follows the uncovered interest parity (Clarida et al., 2001). Therefore, the equilibrium in the foreign exchange rate market is given by the equality of net trade flows and net capital flows. So, for example, if the real interest rate rises, investment and net capital outflows decrease. The IS curve shift to the left and the real exchange rate

depreciates, causing an increase in exports with the IS curve that tends to be flatter than in a closed economy (Romer, 1999). These models include an exchange rate channel: if the uncovered interest parity condition holds, changes in interest rates immediately affect the exchange rate. These, in turn, cause an expenditure switching effect on demand, depending on the relative elasticities of domestic and foreign goods.

This subsection showed how the focus of the inflation targeting model is on the interest rate rather than on the quantity of money. Post-Keynesians have criticised this model based on a specific interpretation of the liquidity preference. This is discussed in the following sub-section.

The Post-Keynesian critique of inflation targeting

It may be worth mentioning that the Post-Keynesian school is not represented by an entirely homogeneous monetary theory. The horizontalists argue that money demand is horizontal: money is endogenously driven by the real economy. Banks just transmit the real sector demand which is accommodated by the central bank, so that the interest rate is not an outcome of private sector portfolio decisions.[8] Given that money supply can fluctuate, the central bank has full authority to set the interest rate, which is later marked-up by banks in their interaction with the private sector (Lavoie, 1984; Moore, 1988a; Wray, 1992). A different Post-Keynesian view (Minsky, 1975; Dow, 1996; Chick and Dow, 2002; Kregel, 1980) maintains that interest rates are not exogenously set by the central bank, rather they are partly endogenous: banks do not passively accommodate private sector demand for money, rather they act according to their own liquidity preference and balance sheet considerations.

Besides its diversity, the Post-Keynesian critique of IT points to its neoclassical nature, to its unoriginality and to its simplistic idea of money, clearly manifested in the explanation of inflation: in general, Post-Keynesians see the inflation targeting model as a new version of the neoclassical synthesis. For example, there is only a single possible equilibrium, restrictive monetary policy leads to lower inflation with no long-run impact on real interest rates and

[8] There is an extensive debate on the shape of the money demand curve and on the degree of its inclination, for example, see Goodhart (1989).

economic activities; expansionary fiscal policy leads to higher inflation, higher real interest rates have no impact on real activities in the long-run (Lavoie and Seccareccia, 2004). The aggregate supply curve is generally downward sloping implying that low inflation rates are beneficial for growth.

Nor does the model represent a significant novelty in comparison to Monetarism: first, this new framework was the result of a synthesis between endogenous money and the mainstream. This is nicely highlighted by Lavoie and Seccareccia (2004): *"Ironically, this endogenous money hypothesis was pinned to some aspects of Milton Friedman's old-line macroeconomics, in particular the traditional vertical Phillips curve with inflation expectations, thus giving rise to what has been called the new consensus, in monetary economics, also sometimes dubbed the New Keynesian Synthesis. However, it could as just be called Wicksellian economics"* (p.3).

Second, the model is associated to monetarist features: the variant of the Phillips curve (equation 5) can be considered as equivalent of the NAIRU (Non-Accelerating Inflation Rate of Unemployment) as shown by Arestis and Sawyer (2002; 2004a, 2004b). The equation is accelerationist because the inflation rate accelerates when the demand growth rate exceeds the natural rate of growth; the trade-off between inflation and unemployment or between inflation and output is only in the short-run (Lavoie, 2004). As a consequence, the supply of money is exogenous and a money growth rule has been replaced with a real interest rate targeting rule: *"Paradoxically, the new consensus is simply a variant of monetarism, but without any causal role for money. The new consensus is monetarism without money!"* (Lavoie, 2004, p. 23). More specifically, the natural real interest rate is assumed to be controlled by the central bank that is supposed to be able to set real interest rates through the absolute control over the shortest nominal rates. In reality, however, the setting of interest rates is not an entirely domestic matter independent of exchange rate and international interest rates (Arestis and Sawyer, 2004b).

Third, the model maintains a unidimensional approach to money that, again (see section 2.3.1), is clear with respect to inflation. This is only demand-pulled, since interest rates are used to control aggregate demand. Inflation is addressed in new Keynesian models as a result of temporary shocks which can cancel each other out in the long-run. There is no possibility for

permanent inflation increases which may be due to wage increases or change in expectations (Arestis and Sawyer, 2004b).

On the contrary, Post-Keynesians maintain that inflation can have other sources: it can be cost-pushed because of the effects of an increase of world prices (or increase in commodity prices) or because of a shortage in specific sectors (Fontana and Palacio-Vera, 2002).

2.3.3 Dollarisation according to mainstream economics

In the previous section, I reviewed the paradigm shift from the old monetary target to the new IT consensus. The theories discussed above were put forward for advanced countries with developed financial systems. However, many CDDCs, and Peru among them, face the problem of dealing with a monetary system with two currencies in circulation, the domestic one and the US dollar. The focus of this sub-section is to explain how Monetarists and New Keynesians have considered the specific problem of dollarisation, with a particular attention to the transmission mechanism and the effectiveness of monetary policy.

This sub-section first illustrates the monetarist theoretical and empirical approaches to dollarisation which focuses on the asset side. Second, it reviews the New Keynesians' contribution to the issue with their additional analysis of the liability-side of money. Finally, I will consider some conclusions on the effectiveness of monetary policy in partially dollarised economies, which will be relevant for the empirical part of this thesis.

Monetarists conceptualise dollarisation consistently with their definition of money: they distinguish transaction dollarisation and financial dollarisation reflecting two definitions of money, as a medium of exchange and as a store of value, respectively. This distinction corresponds to two empirical models, the currency-substitution model and the asset-substitution model. Finally, they consider real dollarisation which reflects the definition of money as a unit of account. Accordingly, the effects of the various types of dollarisation are considered to be different. These three types of dollarisation are explained hereafter.

Transaction dollarisation is studied in the currency-substitution model. Generally, the model is based on the idea that, in the presence of assets denominated in two different currencies, individuals shift their real balances from one currency to the other, depending on the prevailing opportunity costs.

The model is related to the debate on the stability of money demand (Miles, 1978)., which is problematic for the forecast of the monetary target: changes in velocity of money are only due to the instability of money demand since money supply is assumed to be stable and controlled by the monetary authority. Historically, this debate emerged after the break down of Bretton Woods, when the US dollar became the international medium of exchange (Giovannini and Turtelboom, 1992). A floating exchange rate is the only guarantee of a country's monetary independence. In this case, the only source of instability of money demand is due to sudden changes in the velocity of money, as happened in the major industrialised countries in the 1970s (Brittain, 1981). On the contrary, with a pegged exchange rate regime, a country is subject to the monetary policy of the anchor country; hence, shocks affecting the pegged currency are immediately transmitted to the domestic currency: any instability in money demand is explained by the existence of dollarisation.

Additionally, currency-substitution may create instability also on the supply side: provided that inflation is caused by changes in money supply and that a quantity of money can be transferred across borders, then change in money supply in the USA can affect inflation in the dollarised country unless the dollarised country adjusts its money supply (Miles, 1978).

The generic formulation of the model (Brittain, 1981; Ortiz, 1983; Ramirez-Rojas, 1985; Rojas-Suarez, 1992) is used to test currency substitution and it is based on the following demand for money equation:

$$M_d = a + b\,y + c\,E\,(\pi) + d\,E(e) \qquad (7)$$

Where M_d is the real money balance of the domestic economy, y is real income, E(π) is expected inflation and E(e) is the expected depreciation of the exchange rate.

Hence, dollarisation is measured as the ratio between the real domestic money balance (M_d) and the foreign real money balance (M_f). A simplified version of the model used is:

$$\frac{M_d}{M_f} = \alpha \frac{\pi_d}{\pi_f} + \beta (r_1 - r_2) = \gamma E (e) \quad (8)$$

Where $\frac{\pi_d}{\pi_f}$ represents the relationship between the domestic and foreign inflation which can be referred to the PPP exchange rate formulation, and r_1 and r_2 are the expected returns of the two currencies (Girton Roper, 1981).

The above equations reveal the idea that, in a context of high inflation and expectations of exchange rate depreciation, residents tend to protect the value of their wealth by increasing their holding of foreign currency *vis-á-vis* domestic currency.

As a result, exchange rate fluctuations are considered to be a primary source of dollarisation. For example, Ortiz (1983) sustains that, in Mexico, elasticity of substitution between domestic and foreign currency increases in periods of floating exchange rate more because of the currency risk than because of interest rate spread. This is considered to be the case whatever the exchange rate regime (Calvo and Veigh, 1992).

In terms of policy implications, since dollarisation leads to a loss of seniorage, currency-substitution models highlight the danger of financing a budget deficit out of inflation tax. In other words, fiscal discipline is at the core of the monetarist view. However, given the lack of fiscal discipline in the developing world, dollarisation is seen as a way around exchange rate risk caused by underlying political risk (Ortiz, 1983) and lack of government credibility (Schmidt-Grohe and Uribe, 2001; Chang, 2000; Chang and Velasco, 2002).

The more the dollar is a perfect substitute of the domestic country,[9] the less the monetary policy is independent (Miles, 1978): dollar money held in foreign currency deposits in the domestic financial system represents a potential outflow and an interference with monetary

[9] Two currencies are perfect substitute when they are equivalent of one world currency: *"In that case there is the equivalent of one world currency, just as when central banks make currencies perfect substitutes on the supply side by fixing exchange rates...an increase in the nominal money supply in either country will increase the real balances used in both countries and cause the price level in both countries to rise by precisely the same amount"* (Miles, 1978, p.432).

policy. Whether these deposits should be considered part of the financial system depends on their use: if these deposits are used to facilitate international trade transactions and replace deposits held abroad, they do not interfere with monetary policy. On the contrary, if they are used as monetary outflows, then the demand for foreign money changes relatively to the demand for domestic assets, and this is a monetary interference and it has an immediate impact on the balance of payments (Ramirez-Rojas, 1985).

Finally, currency dollarisation has been defined by two main characteristics: symmetry and reversibility. It can be symmetrical when both residents and non-residents hold both currencies, asymmetrical when there is no demand for domestic currency by non-resident (Ramirez-Rojas, 1985). It can be reversible if, with expected decreasing inflation rates, residents switch back to the domestic currency. Empirical evidence shows that currency substitution is neither fully symmetrical, nor reversible (Muller, 1994).

As anticipated in the introduction of this sub-section, the second type of dollarisation, financial dollarisation, is associated with asset-substitution models. In general, these models use portfolio theory. They can explain capital mobility, but cannot explain currency substitution (Thomas, 1985). The asset-substitution model is obtained by accounting for the difference between returns on domestic and on foreign financial assets (e.g. domestic and foreign bonds) when dollar assets are preferred to domestic assets for storing wealth. In this case, the liquidity offered by various types of assets depends on capital liberalisation and financial sophistication. Therefore, most of the literature on financial dollarisation has been developed in the 1990s, when many developing countries have liberalised their capital accounts.

From a New Keynesian perspective, this type of dollarisation is seen as a response to volatile domestic prices rather than to high levels of inflation. Financial dollarisation depends on both volatility of real cash flows from domestic assets (which, in turn, depend on price volatility), and volatility of foreign assets (which depends on volatility of real exchange rate). As a result, according to this argument, on the one hand, policies designed to enhance competitiveness through real exchange rate stabilisation may favour dollarisation. This is because they artificially reduce real exchange rate volatility relatively to price volatility; on the

other hand, inflation targeting with floating exchange rates discourages dollarisation (Ize and Levy Yeyati, 2003). This point will be further discussed in chapter 3 and 5.

The third type of dollarisation, the real or index/price dollarisation, refers to the fact that prices and salaries are indexed to exchange rate fluctuations. This is generally associated with high pass-through: if wages and prices tend to fluctuate with the exchange rate movements then agents tend to switch to the dollar to maintain their income balances more stable. Thus, countries with high inflation and lower degrees of indexation tend to suffer from high real dollarisation (Guidotti and Rodriguez, 1992).

The monetarist analysis of dollarisation illustrated above is entirely asset-based. It was only after the Asian crises of the late 1990s that the New Keynesians developed a critical view of its incompleteness. The concept of liability dollarisation came about to stress the importance of the public and private sector vulnerabilities due to foreign borrowing (Calvo, 2000; Edwards, 2001). This led to the inclusion of a balance sheet channel in the transmission of the monetary policy which recognised an effect of liability dollarisation on aggregate output (Calvo and Reinhart, 2002). Therefore, the inclusion of the liability-side leads to an implicit reduction in the ineffectiveness of monetary policy.

However, most of the empirical analysis within this stream of studies does not concentrate on the effectiveness of monetary policy: first, despite many dollarised countries having managed to defeat inflation, they have not experienced a significant decrease in dollarisation (a ratchet effect). This is seen in high inflation countries, as *"a costly process of development, learning and applying strategies to beat inflation"* (Muller, 1994, p.14). Among these strategies, the literature highlights how financial innovation has tended to accommodate dollarisation: it has been not unusual in dollarised countries, to see the introduction of instruments to rapidly switch between saving deposits in different currencies, the possibility of using various money substitutes and overdrafts, portfolio optimisation methods and the use of American Depositary Receipts (ADRs) to flight towards foreign assets (Mueller, 1994; Mongardini and Mueller, 2000; Havrylyshyn and Beddies, 2003). This contradicts those who believe that "financial repression" is the cause of dollarisation in economies with high inflation (Savastano, 1996).

Second, Reinhart et al. (2003) find an increase in dollarisation worldwide in the last two decades. They also show that inflation has been higher and more volatile in countries with higher dollarisation: real dollarisation increases the exchange rate pass-through which leads central banks to intervene in the foreign exchange market (fear of floating, see sub-section 2.4.1). This point will be further discussed in the empirical part of the thesis.

In conclusion, the conventional wisdom indicates that central banks can conduct an independent monetary policy in case of real and/or financial dollarisation: an important role is then assigned to the exchange rate and its strong impact on inflation expectations and real activity. Only in the presence of transaction dollarisation, it is argued, monetary policy loses its effectiveness because the relevant interest rate for inter-temporal consumption decisions, and thus aggregate demand, is the dollar interest rate (Batini et al., 2008).

2.3.4 A critique of the mainstream views on dollarisation

This section presents a critique of how dollarisation has been addressed by the monetary target and the inflation targeting models.

First, the monetarist approach has been developed around the commodity-money view where dollarisation is conceptualised exclusively on the basis of dollars as asset-money: both transaction and financial dollarisation concentrate on two different forms of the same definition of (asset-) money. The way in which dollarisation is generally measured illustrates this point: transaction dollarisation is measured by the amount of cash and cheque payments in dollars (ATM withdrawals, cheques, interbank transfers and direct debits). Financial dollarisation is then generally measured as a ratio of broad money in the banking system and credit to the private sector. Finally, real dollarisation is indirectly measured by the pass-through rather than by the estimation of the quantity of foreign currency liabilities in the private sector and the direct effects on the production economy in terms of prices and wages.

Second, in order to show how dollarisation further substantiates the Post-Keynesian critique of the monetarist model with respect to the transmission mechanism (section 2.3.1), I

add an additional currency to the model, indicated by the superscript $. By adding the dollar components to equation (2), it is possible to derive the money multiplier.

$$M = (C_P + D) + \left(C_P^{\$} + D^{\$}\right) = C_P + C_P^{\$} + D + D^{\$} \quad (9)$$

$$M_o = (C_P + C_B) + \left(C_P^{\$} + C_B^{\$}\right) = C_P + C_P^{\$} + C_B + C_B^{\$} \quad (10)$$

Dividing (9) by (10):

$$\frac{M}{M_o} = \frac{C_P + C_P^{\$} + D + D^{\$}}{C_P + C_P^{\$} + C_B + C_B^{\$}} = \frac{{C_P}/{D} + {C_P^{\$}}/{D} + 1 + {D^{\$}}/{D}}{{C_P}/{D} + {C_P^{\$}}/{D} + {C_B}/{D} + {C_B^{\$}}/{D}} = \frac{d + d^{\$} + 1 + DR}{d + d^{\$} + R_B + R_B^{\$}} \quad (11)$$

Hence $\Delta M = \Delta M_o\left(\frac{d + d^{\$} + 1 + DR}{d + d^{\$} + R_B + R_B^{\$}}\right) = m^{\$}\,\Delta M_o$ (12)

Where C_P= Local currency in the hands of public

$C_P^{\$}$= Dollars in the hands of public

D= Deposits

$D^{\$}$ = Deposits in dollar

C_B= Local Bank Reserves (sum of required reserves and excess reserves)

$C_B^{\$}$= Dollar Bank Reserves (sum of required reserves and excess reserves)

d= public's preference of local currency/deposit ratio

R_B= Local bank reserves over deposit ratio

$d^{\$}$= public's preference of dollars/deposit ratio

$R_B^{\$}$= Dollar bank reserves over deposit ratio

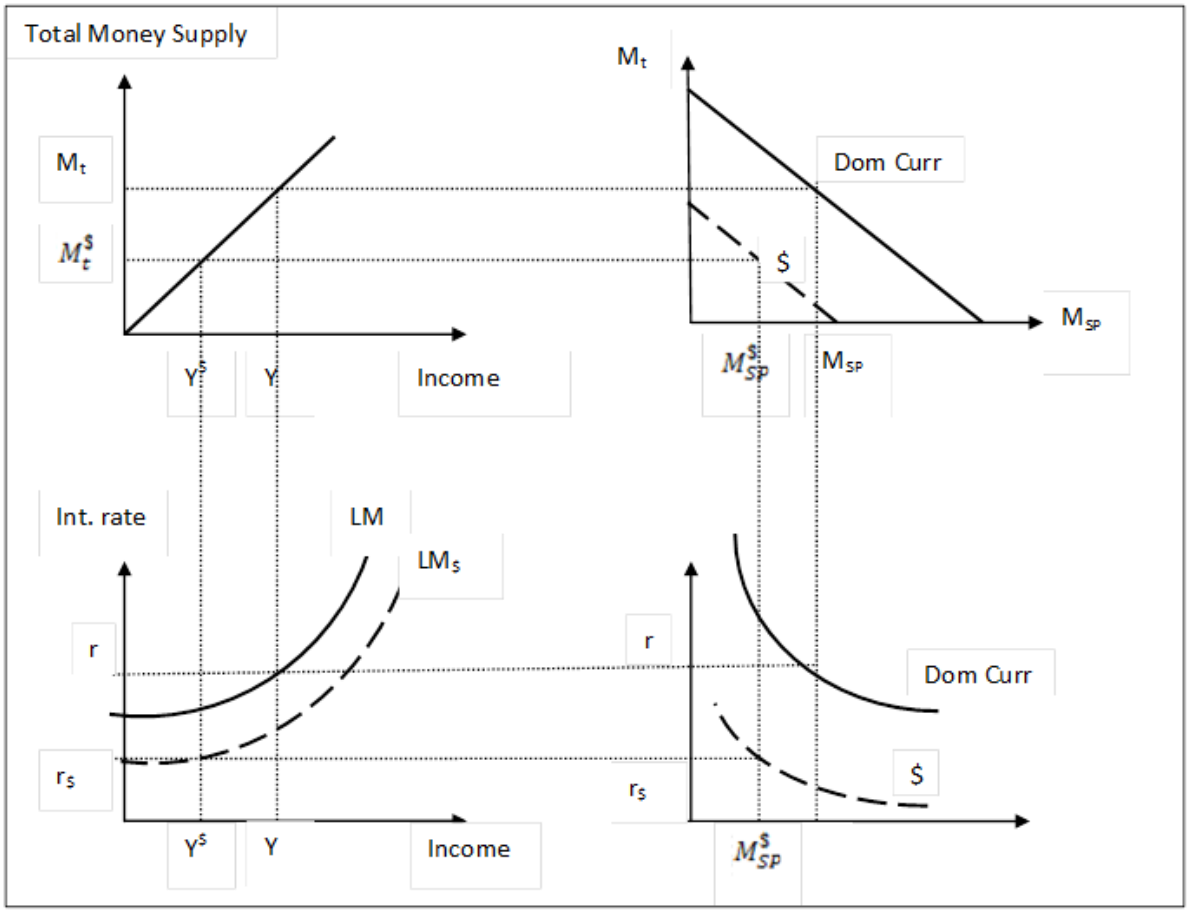
DR = ratio of dollar deposit to local currency deposit

$m^{\$}$ = money multiplier in a dollarised economy

The money multiplier now depends also on $d^{\$}$ and on the dollarisation rate DR, assuming that $R_B^{\$}$ remains a policy variable. As a result, in case of dollarisation, in order to keep the control over the money supply, the monetarist model needs a number of (even stronger) additional assumptions: the dollarisation of the economy will have to stay constant in the short-term, and the public's preference of maintaining a currency-deposit ratio will have to remain simultaneously constant for both currencies. In reality, dollarisation may increase or decrease in the economy as preferences change. Thus, dollarisation vindicates the Post-Keynesian criticism of the idea that money supply cannot be controlled.

Third, following the critique of the IS-LM reviewed in section 2.3.1, I also show below the effects of dollarisation on the transmission of monetary policy. By adding the dollar component to the domestic supply in the money market schedule, I adapt the LM schedule to account for dollarisation as shown in Figure 2.3.

Figure 2.3: LM schedule in case of dollarisation



In the bottom-left quadrant, providing that there is still more domestic currency than dollars in circulation, and that the dollar real interest rate is generally lower than the local interest rate, the economy will present two income levels $Y^{\$}<Y$. From the top left, the two levels of income match the total quantity of money in local currency and dollar terms (transaction dollarisation). Under the assumption that money supply (of both currencies) is fixed, and that, in equilibrium, money demand is the sum of transactions and speculative balances, the top right shows the levels of speculative money $M_{SP}^{\$}$ and M_{SP} corresponding to the interest rates in both currencies in the bottom right. The figure in the bottom left quadrant represents two LM schedules, one for each currency. This shows how monetary policy is not able to control the dollarised part of the economy. In other words, even if the central bank can establish the interest

rate of the dollar reserve deposit of banks, it cannot decide the yield of the other dollar products. These are subject to the dollar interest rate that is determined by the Federal Reserve in the USA and in the capital market.

Finally, in a dynamic context where the dollar supply varies (the dotted lines in the figure starts to shift) with trade and capital flows, transfers in and out between local currency and dollar will make multipliers, velocities and monetary aggregates (of both dollar and domestic currency) volatile. To further illustrate this point, let us consider the case of increasing dollarisation. If this is caused by persistent high inflation, then the $LM^{\$}$ schedule will converge to the LM schedule as the public exchanges local currency for dollars (or accumulates dollar and spends local currency). This puts pressure on the exchange rate which can exacerbate inflation if devaluation is significant. In this case, the central bank has the only choice of intervening in the exchange rate market to contain inflation and to discourage exchange rate speculations which would cause liquidity issues in the domestic banking system.

The reminder part of this sub-section is dedicated to the New Keynesian framework: here, it appears that dollarisation can only enter into the model from the IS equation in the form of an exogenous variable. Dollarisation does not interfere in either the MP (in the formulation of the interest rate) nor in the AS schedules.

To account for dollarisation within the New Keynesian framework, I derive the IS equation from the Banco Central de Reserva del Perú (BCRP) inflation targeting framework (Rossini and Vega, 2007). This will be further discussed in the empirical part.

Thus, the modified IS equation will be:

$$= -a_1(r - E\pi) - a_2 r^{\$} - a_3 \Delta RER + u \qquad (13)$$

Where $r^{\$}$ is the real US interest rate and RER = e + ($\pi^{\$} - \pi$)[10]

[10] The real exchange rate (RER) is calculated as the nominal exchange rate (e) adjusted by the difference in inflation between the US ($\pi^{\$}$) and the domestic economies.

Therefore, the foreign real interest rate has a negative relationship with the growth rate; a positive shift in the exchange rate has a negative relationship with growth. In terms of variables this means that:

$$y = f\ (r, E\pi, e, r^{\$}, \pi^{\$}\ ) \qquad (14)$$

which can be transformed in

$$r = g\ (y, E\pi, r^{\$}, e, \pi^{\$}\ ) \qquad (15)$$

Now, I rewrite equation (7) of the monetarist model as follows:

$$M_d = h\ (y, E\pi, Ee) \qquad (16)$$

Since the expected rate of depreciation in PPP terms depends on the differential of the domestic and foreign inflation, and that the exchange rate in terms of uncovered interest rate parity depends also on the foreign interest rate, it is possible to transform equation (16) as follows:

$$M_d = h\ (y, E\pi, e, r^{\$}, \pi^{\$}\ ) \qquad (17)$$

By confronting equations (14) and (17), it is possible to conclude that the inclusion of dollarisation in the model confirms the similarities between Monetarists and New Keynesians: the novelty of the new consensus is the modified IS schedule to account for the effect of dollarisation.

The inevitable conclusion is that, in order to avoid unexpected changes in the IS curve, the monetary authority has to smooth exchange rate fluctuations. This becomes part of the central bank's optimisation problem, as confirmed by the empirical literature on transaction dollarisation: dollarisation contributes to exchange rate volatility and consequently undermines the chances of targeting domestic nominal prices. This forces the monetary authorities to intervene in the foreign exchange market in order to attempt an indirect stabilisation of domestic prices (for example, Artis and Gazioglu, 1986; Calvo and Vegh, 1992; Savastano, 1992).

To sum up, this section has revealed that, according to the conventional wisdom, central banks can conduct an independent monetary policy even in a partially dollarised economy. This section reviewed both monetarists' monetary target and New Keynesians' inflation target showing that the two frameworks incorporate dollarisation in similar ways, i.e. as an exogenous factor to add up in an open economy context. In essence, they both link dollarisation to exchange rate volatility (depreciation) in a mono-dimensional way. Therefore, within these models, the only way to control the disturbances created by dollarisation is to smooth the exchange rate volatility by intervening in the foreign exchange market. However, this leads to a policy dilemma.

In conclusion, following mainstream theory, central banks have to face the dilemma of, on the one hand, intervening in the foreign exchange market to stabilise the economy, or, on the other hand, not intervening because a pure floating exchange rate regime, in the context of the IT framework, should lead the economy to de-dollarise. The issue of choosing the right exchange rate policy for CDDCs is the focus of the next sections. The theoretical chapter, chapter 3, will present an alternative conceptualisation of dollarisation which will then be used in chapter 5.

2.4 Alternatives to the current policy paradigm: RER and PEP versus the IT target

Just before the last commodity boom started in 2003, many CDDCs started to adopt the inflation targeting framework. At the turn of the century, monetary stability issues become more urgent since many developing countries gave up their nominal anchor provided by an exchange rate peg: within the choice of alternative nominal anchors such as nominal output, monetary targeting or inflation targeting, the latter predominated. In developed countries, exchange rate pegs and monetary targets were replaced by regimes based on implicit or explicit inflation targets. In general, developing countries, including the commodity dependent ones, moved in the same direction.

Mainstream theory interprets this migration from exchange rate peg toward inflation targeting within its specific framework: with flexible exchange rates, the appreciation of the currency due to a commodity boom acts counter-cyclically, since profitability in the export

sector is eroded and domestic consumers enjoy lower imports prices. This automatic stabiliser implies an adjustment away from commodity producers (Clements and Fry, 2006). On the contrary, currency depreciation may lead to inflation because of the increased prices of imported goods. It also argues that, when financial markets are not well developed, the central bank may experience difficulties in sterilising foreign exchange reserves accumulated through its intervention.

Furthermore, the migration towards inflation targeting also provides support to the so-called "two-corner hypothesis" according to which countries have been pushed to either fixed peg or free floating regimes (Frankel et al., 2001), dismissing intermediate arrangements (Fisher, 2001). However, most countries face the actual problem of mixing inflation and exchange rate objectives with a problem of combining inflation targeting with the flexibility of the exchange rate: in practice, not many countries adopt a pure free floating regime; we will see that Peru positions itself *between* the two corners. Generally a *de jure* free floating regime may still be tempered by central banks' interventions because the market may push the exchange rate too far from its underlying economic fundamentals, the so-called "fear of floating" (Calvo and Reinhart, 2002). A difference between *de jure* and *de facto* exchange rate regimes, then, is detectable in case of significant interventions by the central bank. These interventions are explained by the "exchange rate protectionism": a country protects its tradable goods sector relative to the non-tradable goods by forcing its exchange rate to devalue or contrasting its appreciation via intervention (Corden, 1981; Masalila and Motshidis, 2003). South Korea has implemented this kind of policy after the 1997-8 financial crisis (Eichengreen, 2004). On the contrary, depreciation can have a negative impact on the capital account when dollarised liabilities are accumulated because of the "original sin" (Eichengreen et al., 2003).[11]

However, the current monetary policy fails to propose a proper counter-cyclical approach, which, during a commodity boom, should encourage a movement towards a more balanced productive structure by diversifying away from the commodity sector. It is the struggle to turn around a "commodity curse" (Sacks and Warner, 1997) into a strength that, because of the poor economic performances of CDDCs, led to the so-called "commodity trap" literature (Deaton,

[11] This is defined as *"the inability of a country to borrow abroad in its own currency"* (Eichengreen et al. 2003, p. 3). Dollarised liabilities or the outstanding external debt increases in local term under devaluation.

1999; UNCTAD, 2002).[12] By the same token, export diversification is even more important during periods of recession caused by falling commodity prices: increasing traditional primary export may further depress the market, resulting in a continuous self-destructive deterioration of the terms of trade.

Counter-cyclical monetary policy would play an essential role in the way out of underdevelopment. Consensus has been criticised by the supporters of RER target:

> *"The intra-cycle movement of the real exchange rate should be instrumental to ensuring competitiveness of a country's burgeoning industries and sectors. Adopting clean floating generates the nominal exchange rate movement pro-cyclical to the major export product price – an appreciation in the upturn and a depreciation in the downturn of the cycle. There is no guarantee that clean floating makes the real exchange rate converge to the one that could serve the overriding objective of diversification"* (Nissanke, 1993, p. 65).

In this section, I emphasise the issues associated with the IT framework in relation to the characteristics of CDDCs. Here, the focus is not on the IT in general, but it is rather on the adjustments to macroeconomic mechanisms related to commodity price shocks typical of CDDCs. First, these are reviewed under the IT framework, and, second, I compare the results with the alternative Real Exchange Rate (RER) targeting. A detailed comparison between inflation targeting and RER is presented in section 2.4.2. This comparison allows me to tease out the pro-cyclicality of the IT framework and consequently, its inadequacy for CDDCs. The section concludes with an analysis of advantages and disadvantages of the RER target relatively to inflation target and will introduce a further comparison between the two alternatives to inflation target, namely managed RER and Peg Export Price (PEP).

To conclude, the effects of the commodity curse can be reduced through the adoption of RER targeting which may be a more sensible option for many CDDCs. However, a diversification of the commodity basket is an effective solution to both long-term decline and

[12] Among the causes of the commodity curse, the supply management argument maintains that the price fall of commodity prices during the 1980s was mostly the result of the increase in supply relatively to a stable demand (Maizels et al., 1997). As a consequence, many countries applied structural adjustment programs that allowed their currencies to depreciate. This, in turn, encouraged greater exports to cover the trade balance, causing commodity price deflation.

volatility of commodity prices; the increase of non-traditional exports, and so a radical diversification, remains the final long term strategy for development. This argument will be taken up in the concluding chapter.

2.4.1 The new-consensus on monetary policy stance and the control of inflation

This section is a brief introduction to the next sub-section which compares IT and RER targets by originally formulating both models in equation terms. The new-consensus on monetary policy analysed in the previous section is what central banks around the world tend to adopt. Inflation targeting is defined in the New Keynesian Perspective as a monetary policy carried by interest rate movements which are non-neutral in the real economy given the assumption of nominal price rigidities. The interest rates movement are established by the monetary authority's reaction function which results from an optimisation problem, it minimises a loss function on the squared differences of inflation and its target, and of the observed and potential output (see equation 6 above).

The adoption of a monetary rule for an open economy has been obtained by extending the original formulation developed for the USA (Taylor, 2001; Clarida et al., 2001). It is a two sector (tradable and non-tradable) model of a small economy in which domestic and foreign goods are imperfect substitutes. The increase of domestic real interest rates determines an appreciation (thus the term-of-trade changes) that induces an expenditure switching effect on demand. The term-of-trade is positively correlated with the output gap.

Since this framework has been developed for closed developed economies, it does not include commodity prices: monetary rules tend to measure inflation net of commodity prices. For instance, core inflation does not consider energy or food prices (Frankel, 2006). Among the different choices of price targets, the domestic consumer price index has been preferred to export prices because in large industrialised countries instability is associated more with domestic factors. However, as shown in the previous section, export prices are likely to be more destabilising than domestic prices in CDDCs.

2.4.2 Comparing IT and RER: macro adjustments to trade shocks and path to development

The present sub-section illustrates some critical considerations which will be further developed in the empirical part, namely the comparison between two different policy proposals IT versus RER stabilisation. Following Edwards (1985), below I express the relevant economic relations in terms of variables, parameters and equations in order to compare and contrast IT in relation to RER under different trade shock scenarios. This exercise will lead to the conclusion that RER stabilisation is the preferred exchange rate policy.

Variables

S_N = Nominal Exchange Rate is defined as domestic currency units per unit of foreign currency

T= Terms-of-Trade $$T = \frac{P_E}{P_I} = \frac{P_{ex} / S_N}{P_{im} / S_N} = \frac{\varphi P_c + (1-\varphi) P_{ot}}{P_{im}} \qquad (18)$$

P_E =price of exports in foreign currency

P_{ex} = price of exports in local currency

P_I =price of imports in foreign currency

P_{im} = price of imports in local currency

P_C = price of commodity in foreign currency

P_c = price of commodity in local currency

P_{OT} = price of other tradables in foreign currency

P_{ot} = price of other tradables in local currency

$P_{T\,f}$ = price of tradables of the foreign economy

P_T = price of tradables of the local economy

$P_{N\,f}$ = price of non-tradables of the foreign economy

P_N = price of non-tradables of the local economy

P_d = general price level of the domestic economy

P_f = general price level of the foreign economy

M = nominal money

Y = real income

R= Foreign reserves

C= domestic credit as sum of loans to commercial banks and government claims

F= fiscal deficit or government borrowing

O= other assets of central bank excluding government claims

x_t = rest of factors influencing exchange rate

Q_c = quantity of commodities sold

i_t = rest of factors generating real income

T = tax on commodity revenues

t = other government income

G= government spending

Parameters

τ_1 = weight of reserves related to changes in M (see eq.19)

τ_2 =weight of reserves related to changes in P_C (see eq.19)

ω = weight of balance of R relative to C (see eq.20)

ϕ_1 =weight of F (see eq.21) ϕ_2 =weight of O (see eq.21)

α= weight of the non-tradable sector. Where $0 < \alpha < 1$, such as if α=0 there is only tradable sector (see eq.22)

β= weight of the non-tradable sector for the foreign economy (see eq.18)

θ =weight of import traded goods. Where $0 < \theta < 1$, such as if θ =0 no goods are imported (see eq.23)

λ =weight of M (see eq.24)

η =weight of Y (see eq.24)

φ = weight of the commodity export sector in the total export sector (see eq.28)

One of the key instruments of the new-consensus monetary policy, with respect to the trading sector, is the management of foreign currency reserves. The central bank accumulates R thanks to the increased commodity revenues due to a higher P_c. In this way, a buffer is built to

defend the currency from depreciation during the burst periods. However, reserves also reflect money supply through the money multiplier. Thus, foreign reserves is a function of money and commodity prices:

$$R = \tau_1 M + \tau_2 P_C \qquad (19)$$

A change in reserves has an impact on nominal money forcing the central bank to sterilise. This has an influence on the domestic credit:

$$M = \omega\ R + (1-\omega)C \qquad (20)$$

Inflation targeting implies an independent central bank to avoid government pressure and keep borrowing costs low. However, domestic credit creation is linked to fiscal deficit. This can be considered exogenous since revenues heavily depend on commodities exports:

C= ϕ_1 F + ϕ_2 O (21) Where $F = TQ_c P_c + t - G$ (21b)

The adoption of stabilisation funds is a way of allowing commodity prices to endogenise fiscal policy (Budnevich, 2002), so that these funds can be used in a counter-cyclical way.

I will now compare the consequences of trade shocks (i.e. imports and exports price shocks), for IT and RER respectively.

Inflation targeting as a nominal anchor

Import Price shock (import price increase)

An increase of import prices P_I deteriorates the terms-of-trade (equation 18), if S_N does not compensate negatively (appreciation). An increase of P_I induces an increase of domestic inflation P_d in both tradable (sum of commodity sector and other-tradable) and non-tradable sectors which can be defined below:

$$P_d = \alpha P_N + (1-\alpha)P_T \qquad (22)$$

Where the price of tradable is

$$P_T = \theta P_{im} + (1-\theta)P_{ex} \quad (23)$$

And the price of non-tradable is

$$P_N = P_T + \lambda M + \eta Y \quad (24)$$

Where the price of tradables in local terms is a direct source of inflation for the non-tradable sector.[13] The real income is given by the commodity revenue (quantity sold times price) and other factors:

$$Y = Q_c P_c + i_t \quad (25)$$

During a commodity boom, inflation tends to increase because of the income effect in the non-tradable sector (equation 24). Higher nominal interest rates are required, generating a nominal exchange rate appreciation (decrease of S_N and temporary improvement of the terms-of-trade). However, this induces an *expenditure switching* negative effect on demand: a reduction of economic activity and cheaper imports bring inflation down, but may generate a new deterioration of the trade balance if the appreciation influences the volume of exports.

Export Price shock (commodity price decline)

A negative P_E shock (decrease of export price), given mainly by a drop in the commodity price P_C, deteriorates T. In a free-floating exchange rate regime the commodity-currency link is: [14]

$$S_N = -P_C + x_t \quad (26)$$

[13] This is the definition used by Edward (1985) which reflects a monetarist stance.

[14] A commodity currency is defined as a currency of a commodity-exporting country whose value has a strong correlation with commodity prices. Most of the empirical evidence has been written following econometric models of co-integration between a trade weighted basket of commodity prices and its country real exchange rate (Cashin et al., 2003).

Currency depreciates as the commodity price decreases. However, the effect of depreciation in the aftermath of a commodity burst may induce upward pressure on inflation due to the increase of import prices as $P_I S_N = P_{im}$; depreciation may facilitate exports of other tradables (as P_{OT} decrease), the expansion of which is difficult to implement during a period of lower commodity revenues, especially if the decrease of commodity prices is due to lower global growth. Furthermore, when prices of the exported commodities start to turn downwards, international credit availability diminishes as a result of the expected decrease of income revenues. This pushes bond yields up making re-financing more expensive while credit agencies downgrade the country. In extreme cases, the IMF becomes the only available refinancing option.

Real Exchange Rate as a real anchor

Similarly to the S_N, here the RER (S_R) is defined in such a way that an increase of the index represents a depreciation in real terms. Stabilising the real exchange rate means targeting the product of the nominal exchange rate and the ratio of foreign prices to domestic prices:

$$S_R = S_N \frac{P_f}{P_d} \qquad (27)$$

Where

$$\frac{P_f}{P_d} = \frac{\beta P_{N\,f} + (1-\beta) P_{T\,f}}{\alpha P_N + (1-\alpha) P_T} \qquad (28)$$

Similarly to the previous section, it is important to understand the adjustment mechanism to trade shocks in the case of RER targeting.

Import Price shock (import price increase)

If RER has to remain constant (or within a band), when P_f increases there are two possible adjustments: first, S_N needs to decrease (appreciation consistently with IT), otherwise

there are gains in competitiveness because S_R increases too (real depreciation). Second, P_d needs to increase to retain S_R = constant (maintain competition) and S_N = constant (maintain stable nominal exchange rate).

The conclusion is that an optimisation problem arises when choosing between stabilising either inflation or nominal exchange rate. That is, if foreign prices increase, in order to keep export competitive, local prices need to rise when the nominal appreciation is limited to favour exports. A series of studies have analysed this trade-off in the 1990s (see, for example, Montiel and Ostry, 1991); a cash-in-advance model based on a simple representative-consumer explains that targeting a more depreciated RER requires higher inflation today than in the future (Calvo et al., 1995). In conclusion, a managed RER regime provides more stable terms-of-trade, and can allow continuing development of the other-tradable sector during a commodity boom.

Export Price shock (commodity price decline)

A decrease in P_C, given that P_f is exogenous and generally less volatile than P_C, implies a lower domestic inflation pressure due to lower revenues. That translates in a S_R depreciation. Similarly to the IT case, because of the commodity-currency behaviour, this is re-enforced by a higher S_N (depreciation) in case of floating exchange rate regime: depreciation should favour the export of other-tradables, but, in practice, it may re-enforce the decline of commodity prices in the case of over-supply. This is the reason why the development of the other-tradables sector becomes a crucial strategy that would allow a shift from commodity revenues dependence to a more diversified source of income.

2.5 Comparing the alternatives to IT: PEP and managed RER targets

Once advantages and disadvantages of the managed RER relatively to the IT regime have been clarified in the previous section, this section reviews two policy proposals alternative to IT

and it is organised as follows. First, Frankel's PEP (Peg the Export Price) idea is discussed in both the nominal and the real versions. I made these two explicit since this distinction is not always clear in his writings (Frankel, 1999; 2003); second, I derive a managed RER regime; third, the latest Frankel's adjusted proposition (Peg the Export Price Index) will be considered (Frankel, 2005). Finally, I will concentrate on the capital account and how financial development influences the two alternative proposals of PEP and managed RER.

2.5.1 Frankel's proposal (PEP)

To avoid the case of export price shock described in the previous sub-sections, Frankel (1999, 2003) proposes a way to stabilise commodity revenues by pegging the exchange rate to the commodity price, or index of a basket of commodity prices. This solution has never been implemented; however empirical simulations show its effect (Frankel, 2002; Setser, 2007). I will run some simulations for Peru in the empirical part of the thesis.

However, this solution presents a number of problems: firstly, other variables such as inflation and the exchange rate will be influenced by the volatility of the commodity exported which does not guarantee nominal stability. Also, commodity prices are difficult to forecast (see section 2.2). As a result, even though PEP automatically overcomes shocks due the price of the commodity exported, it fails in dealing with other external or internal shocks. Therefore, in order to maintain external balance, the government is forced either to adopt fiscal contraction to reduce demand for import or to borrow to fund imports. Under a prolonged pressure, this may force the abandonment of the peg. So, if initially the commitment to the peg may be perceived as credible by traders and investors, it may not be so at a later stage.

Secondly, as the tradable sector is the sum of the commodity sector and other-tradable:

$$P_T = \varphi P_c + (1-\varphi) P_{ot} \qquad (29)$$

By pegging the exchange rate to the commodity export price, it is assumed that φ (the weight of the commodity export sector in the total export sector) is almost equal to one: the

volatility of the commodity price is transmitted to the exchange rate and the increased instability of the exchange rate disrupts the development of the other-tradable sector. Furthermore, if inflation is dominant in the non-tradable sector, $P_d = P_N$ because α=1 (equation 22), then an increase of the export commodity sector may lead to Dutch disease.

Lastly, if all countries apply this proposal simultaneously, commodity prices become endogenous. As a consequence of the fall in commodity prices, then currency depreciations imposed by the pegs can lead to global increase in exports (supply) which depresses the price further (Maizels et al., 1997).

Pegging exchange rate to the nominal export price (nominal anchor)

I will now show the impact of the PEP proposal on the real exchange rate. Frankel's main objective is to peg the export price in order to guarantee constant revenues in local currency terms. Below I formulate the relevant relations for a commodity dependent country:

P_{ex} = constant=k

but, given $P_{ex} = P_E S_N$ then

$$S_N = k / P_E \cong k / P_C \qquad (30)$$

It is necessary to note that the basic relations and the logic are those of Frankel (1999; 2003) but the taxonomy follows Edwards (1985) as in the rest of this section.

Substituting into the real exchange rate equation (27), and considering equations (22) and (24):

$$S_R = S_N \frac{P_f}{P_d} = \frac{k}{P_C} \frac{P_f}{\alpha P_N + (1-\alpha) P_T} = \frac{k}{P_C} \frac{P_f}{\alpha(P_T + \lambda M + \eta Y) + (1-\alpha) P_T} = \frac{k}{P_C} \frac{P_f}{P_T + \alpha\lambda M + \alpha\eta Y} \qquad (31)$$

For simplicity of illustration it is better to consider the reciprocal of (31) and use equation (29):

$$\frac{1}{S_R} = \frac{P_C}{k}\frac{P_T + \alpha\lambda M + \alpha\eta Y}{P_f} = \frac{P_C}{k}\left[\frac{P_T}{P_f} + \frac{\alpha\lambda M}{P_f} + \frac{\alpha\eta Y}{P_f}\right] = \frac{P_C}{k}\left[\frac{\varphi P_c}{P_f} + \frac{(1-\varphi)P_{ot}}{P_f} + \frac{\alpha\lambda M}{P_f} + \frac{\alpha\eta Y}{P_f}\right] \quad (32)$$

In summary:

$$\frac{1}{S_R} = \frac{1}{S_N}\left[\frac{\varphi P_c}{P_f} + \frac{(1-\varphi)P_{ot}}{P_f} + \frac{\alpha\lambda M}{P_f} + \frac{\alpha\eta Y}{P_f}\right] \quad (33)$$

[a] [b] [c] [d]

This means that the difference between the real exchange rate and the nominal exchange rate is determined by the term between parentheses. This is given by the sum of four sectors: [a] the commodity sector which is determined by its price, [b] the other-tradables sector determined by its price, [c] the monetary sector determined by the supply and demand for money and [d] the real sector defined by the real income.

Pegging exchange rate to the real commodity price (real anchor)

To overcome the problem of the terms-of-trade deterioration in case of high domestic inflation, as it tends to happen in the case of IT previously discussed, Frankel (2003) seems to prefer a real target. This is the main idea of the second proposal. Therefore, the exchange rate is pegged to the commodity price and discounted by domestic inflation. In this way, a generalised inflation trend, which affects both the domestic and foreign economies, does not influence the peg. The peg follows the *real* detachment of the commodity price relatively to other prices. The real exchange rate is defined as:

$$S_R = -k\ \frac{P_C}{P_d} \quad (34)$$

Thus, I transform the real exchange rate as in the previous case:

$$S_R = -k\frac{P_C}{\varphi P_c + (1-\varphi)P_{ot} + \alpha\lambda M + \alpha\eta Y} \tag{35}$$

It is possible to obtain a reciprocal form analogous to equation (33):

$$\frac{1}{S_R} = -\frac{1}{kP_C}\left[\varphi P_c + (1-\varphi)P_{ot} + \alpha\lambda M + \alpha\eta Y\right] = -\frac{1}{k}\left[\varphi\frac{P_c}{P_C} + (1-\varphi)\frac{P_{ot}}{P_C} + \alpha\lambda\frac{M}{P_C} + \alpha\eta\frac{Y}{P_C}\right] \tag{36}$$

In summary:

$$\frac{1}{S_R} = -\frac{1}{k}\left[\varphi S_N + (1-\varphi)\frac{P_{ot}}{P_C} + \alpha\lambda\frac{M}{P_C} + \alpha\eta\frac{Y}{P_C}\right] \tag{37}$$

But if real income is mostly given by the commodity sector, so we can disregard i_l in equation (25), then:

$$\frac{1}{S_R} = -\frac{1}{k}\left[\varphi S_N + (1-\varphi)\frac{P_{ot}}{P_C} + \alpha\lambda\frac{M}{P_C} + \alpha\eta Q_c\frac{P_c}{P_C}\right] = -\frac{1}{k}\left[\varphi S_N + (1-\varphi)\frac{P_{ot}}{P_C} + \alpha\lambda\frac{M}{P_C} + \alpha\eta Q_c S_N\right] \tag{38}$$

This result in equation (39):

$$\frac{1}{S_R} = -\frac{1}{k}\left[(\varphi + \alpha\eta Q_c)S_N + (1-\varphi)\frac{P_{ot}}{P_C} + \alpha\lambda\frac{M}{P_C}\right] \tag{39}$$

This means that the reciprocal of the real exchange rate is pegged to the term between parentheses. In the case of equation (37), this is given by the sum of four terms: [a] the nominal exchange rate, [b] the other-tradables sector determined by its price, [c] the monetary sector determined by the supply and demand for money and [d] the real sector defined by the real income. In the extreme case of a single sector economy, the reduced version, equation (39), merges the term [d] with the nominal exchange rate, since real income is determined by the volatility of the nominal exchange rate if production is constant.

In order to compare the various proposals in sub-section 2.5.3, I now formulate, using the same taxonomy and method, the third proposal based on the managed RER.

2.5.2 The way out of commodity curse: managed RER (Edwards)

Nissanke (1993) suggests a way to pursue RER stabilisation by keeping the real exchange rate in a range:

"... a modified PPP crawl can be a most practical framework to follow, whereby the nominal exchange rate is altered with regularity to keep the real exchange rate constant with several discretionary provisos incorporated to allow an adjustment in response to permanent real shocks" (pp.66-67).

Without designing the ex-post S_N adjustment process in detail, it is likely that the intervention in the foreign exchange market will be frequent to allow small movements in order to maintain the currency volatility under control. The periodical manipulation of S_N allows to keep the RER around its target.

This type of proposal is consistent with the definition Edwards (1985) provides for the real exchange rate even though he *"uses the 1970-vintage Chicago definition of the real exchange rate as the price of traded goods in terms of the price of non-traded goods"* (Williamson, 1994, p.14).[15]

Edwards' definition is: $$S_R = S_N \frac{P_{Tf}}{P_N} \qquad (40)$$

Thus, following the same process of transformation used for the previous proposals:

[15] Williamson (1994) further comments on the mainstream character of Edwards' work: *"This definition seems natural to those who have worked primarily with non industrial countries whose exports are predominantly primary products subject to the low of one price, and whose export volume is determined by the supply offered on the world market at a parametric world price rather than by the demand forthcoming at a quoted price. In such an economy the relative price of non-tradable goods determined the incentive to produce exports*" (pp.14-15).

$$S_R = S_N \frac{P_{Tf}}{P_N} = S_N \frac{P_{Tf}}{P_T + \lambda M + \eta Y} \tag{41}$$

The reciprocal is:

$$\frac{1}{S_R} = \frac{1}{S_N}\left[\frac{P_T}{P_{Tf}} + \frac{\lambda M}{P_{Tf}} + \frac{\eta Y}{P_{Tf}}\right] = \frac{1}{S_N}\left[\frac{\varphi P_c}{P_{Tf}} + \frac{(1-\varphi)P_{ot}}{P_{Tf}} + \frac{\lambda M}{P_{Tf}} + \frac{\eta Y}{P_{Tf}}\right] \tag{42}$$

The final equation is very similar to equation (33); this means that the difference between the real exchange rate and the nominal exchange rate is determined by the term between parentheses. In this case too, the latter is given by the sum of four sectors: [a] the commodity sector which is determined by its price, [b] the other-tradables sector determined by its price, [c] the monetary sector determined by the supply and demand for money and [d] the real sector defined by the real income.

2.5.3 Analysis and comparison of the stability properties of each proposal

I will now compare each proposal starting from the equations previously derived. The sub-sections are organised as follows: firstly, I compare RER with nominal PEP versus managed RER (Edwards); secondly, I compare RER with real PEP versus managed RER (Edwards); finally, for completion, I will analyse the Edwards/Frankel's PEPI proposal.

RER with nominal PEP target versus managed RER (Edwards)

The drawbacks of Frankel's nominal target have been highlighted before, but in this section additional considerations will be drawn on the RER: the only difference between equation (33) and (42) are the terms inside the parenthesis. The two equations become identical when two conditions are satisfied simultaneously.

Firstly, they are identical when $P_{Tf} = P_f$, which is possible when the inflation of the non-tradable foreign sector is zero, or very low. This means that the trading partners of the commodity dependent developing country are developed countries capable to adopt IT when the price of non-tradable is kept low (in reality, consumer goods are often imported from industrialised countries which may have adopted IT successfully). The second condition is verified when α=1, which occurs when the domestic inflation is caused only by the non-tradable sector.

In summary, the two equations become identical when domestic inflation is only due to non-tradables and foreign inflation only due to tradables. However, in Frankel's proposal the price of tradables can create inflationary problems because S_N reflects the commodity price volatility, thus this volatility is transmitted to imported consumption good prices. For this reason, it is likely that this type of peg does not guarantee a stable nominal anchor, thus α is generally much lower than one.

In this interpretation, the two proposals are different only in the S_N management which emphasises, as previously noted, the different objectives of the two solutions (commodity revenue stabilisation versus exports diversification).

The comparison between the two proposals is summarised in the next comparative box (Table 2.1) in which the stability properties of each term of the two different targets are shown.

Table 2.1: Comparative box 1 between RER with nominal PEP and managed RER

RER with nominal PEP target		**Managed RER (Edwards)**	
$\frac{1}{S_R} = \frac{1}{S_N}\left[\frac{\varphi P_c}{P_f} + \frac{(1-\varphi)P_{ot}}{P_f} + \frac{\alpha\lambda M}{P_f} + \frac{\alpha\eta Y}{P_f}\right]$ (33)		$\frac{1}{S_R} = \frac{1}{S_N}\left[\varphi\frac{P_c}{P_{Tf}} + (1-\varphi)\frac{P_{ot}}{P_{Tf}} + \lambda\frac{M}{P_{Tf}} + \eta\frac{Y}{P_{Tf}}\right]$ (42)	
S_N	It is pegged to P_C, so it reflects its volatility.	S_N	It is adjusted ex-post with regularity to keep the RER constant. This implicitly means that S_N volatility can be smoothed.
$\frac{\varphi P_c}{P_f}$	**This term is affected by stabilisation as P_c is maintained constant.**	$\frac{\varphi P_c}{P_{Tf}}$	This term maintains same volatility of P_C, given that $P_c = P_C S_N$,unless S_N compensates. Clearly, the instability of this term becomes less relevant for the real economy if the domestic economy shifts towards a more diversified export mix in which φ decreases.
$\frac{(1-\varphi)P_{ot}}{P_f}$	This term is stable only in a mono-export sector (commodity) economy where φ is almost one. Otherwise, given that $P_{ot} = P_{OT}S_N = kP_{OT}/P_C$, is unstable discouraging the development of the other tradable sector.	$\frac{(1-\varphi)P_{ot}}{P_{Tf}}$	**This term is the object of stabilisation. It is more stable because targeting the Real Exchange Rate maintains the other-tradable sector competitive.**
$\frac{\alpha\lambda M}{P_f}$	In order to maintain the peg, reserves will have similar volatility of commodity prices. This may have a significant impact on domestic credit. (See eq. 19 and 20). Depending on the degree of financial development the change in reserves can be sterilised. However, this term represents a source of instability because of reserves volatility (more in the next section).	$\frac{\lambda M}{P_{Tf}}$	The adjustment mechanism ex-post of S_N determines the volatility of reserves. However, in a managed currency regime this term should be more stable than the other proposal. Financial deepening is less crucial in terms of sterilisation issues; however some form of capital control maybe needed to protect the peg.

$\frac{\alpha\eta Y}{P_f}$	**This term is the object of stabilisation objective relative to commodity revenues. If α is close to one, as the price of non-tradable is more influential for inflation, then this term became similar to the other proposal. If the S_N volatility is transmitted to tradable prices, then α decreases reducing the oscillation of this term.**	$\frac{\eta Y}{P_{Tf}}$	In this term commodity revenues follow the path of the commodity cycle. This term will be more unstable in the short-run because income reflects commodity prices fluctuation, more stable in the long-run when economy is more diversified. Nominal income is stable when the all process, which involves also S_N, has reached a more balanced equilibrium.

Note: in bold is highlighted the stabilisation objective.

Table 2.1: Continued

RER with real PEP target versus managed RER (Edwards)

This section is dedicated to the comparison of the two real targeting proposals summarised by the equations (37) and (42).

Three general observations are relevant here. Firstly, observing the denominators of both equations, if we assume that P_{Tf} (mainly manufacturing) is less volatile than P_C, then the terms of the equations (42) are supposed to be more stable than those in equation (37). Secondly, the variable S_N nearly disappears in the Frankel' proposal: it becomes a less important source of volatility given that is pegged to P_C. Thirdly, considerations on α remain the same as in the previous section.

In the next box the stability properties of each term of the two different targets are compared in detail.

Table 2.2: Comparative box 2 between RER with real PEP and managed RER

RER with real PEP target		**managed RER (Edwards)**	
$\frac{1}{S_R} = -\frac{1}{k}\left[\varphi S_N + (1-\varphi)\frac{P_{ot}}{P_C} + \alpha\lambda\frac{M}{P_C} + \alpha\eta\frac{Y}{P_C}\right]$ (37)		$\frac{1}{S_R} = \frac{1}{S_N}\left[\varphi\frac{P_c}{P_{Tf}} + (1-\varphi)\frac{P_{ot}}{P_{Tf}} + \lambda\frac{M}{P_{Tf}} + \eta\frac{Y}{P_{Tf}}\right]$ (42)	
	One variable less in this solution means that there is an easier optimisation problem especially if equation (39) is considered.	S_N	This variable multiplies all terms, therefore becomes relevant in addition to real exchange rate target the adoption of a managed nominal exchange rate policy.[16]
φS_N	The volatility impact of the exchange rate which is pegged to commodities declines as the economy shifts away from commodity dependence.	$\varphi\frac{P_c}{P_{Tf}}$	$\frac{P_c}{P_{Tf}} \cong terms - of - trade$ **T is the object of stabilisation. Thus this term benefits from the RER targeting even tough φ is supposed to decrease over time.**
$(1-\varphi)\frac{P_{ot}}{P_C}$	It is a volatile ratio because of the denominator. This term shows that P_{ot} is affected by the volatility of commodity prices if the structure of the economy shifts more towards other-tradable.	$(1-\varphi)\frac{P_{ot}}{P_{Tf}}$	$\frac{P_{ot}}{P_{Tf}} \cong terms - of - trade$ **Clearly this term is less volatile and allows for a progressive**

[16] There is a case when S_N and RER management are almost incompatible. For example, if a deflation trend develops in foreign countries, then competitiveness is guaranteed by nominal devaluation. If the devaluation does not facilitate importing lower foreign prices, but the general domestic price level remains sticky then further and further depreciation is needed to maintain the export sector competitive.

			decrease of φ moving towards other tradable.
$\alpha\lambda\frac{M}{P_C}$	Regarding foreign reserves volatility and the importance of financial development, same considerations of the previous comparison are valid. However, the volatility of M caused by reserves fluctuation due to P_C volatility is smoothed thanks to the denominator which is the source of the volatility. The variation of nominal money is sort of "standardised".	$\lambda\frac{M}{P_{Tf}}$	Same considerations of the previous comparison are valid. See Table 2.1.
$\alpha\eta\frac{Y}{P_C}$	**From equation (39) this term can be almost reduced to an additional parameter to add to S_N when the economy is very commodity dependent. As far as the economy becomes more diversified this term adds unwanted disturbances.**	$\eta\frac{Y}{P_{Tf}}$	Same considerations of the previous comparison are valid. See Table 2.1.

Note: in bold is highlighted the stabilisation objective.

Table 2.2: Continued

Frankel's PEPI proposal

For the sake of completeness, this sub-section reviews the Peg Export Price Index (PEPI). Frankel (2005) extended his proposal for the case of countries which produce and export more than one commodity. Commodity prices do not necessarily co-move (see section 2.2); the exchange rate moves following the price of the major commodity exported, it can negatively influence the revenue of another uncorrelated commodity sector. For this reason, the peg needs to be set as an index with weights calculated for each significant commodity revenue. Furthermore, this solution works as inflation anchor better than PEP: the exchange rate will be less volatile because the volatility of a single commodity price is diversified away by the other components of the index. However, the higher the number of weights policy makers consider, the less effective the peg becomes to stabilise the income flows related to a particular commodity.

Thus, the nominal PEPI would be created in the following way:

$$S_N = \frac{k_1}{P_{C1}} + \frac{k_2}{P_{C2}} + ... \quad (43)$$

The real PEPI would be:

$$S_R = -k_1 \frac{P_{C1}}{P_d} - k_2 \frac{P_{C2}}{P_d} - ... \quad (44)$$

where:

P_{C1} = Price of commodity 1 in foreign currency

P_{C2} =Price of commodity 2 in foreign currency

k_1 = Weight of peg in relation to commodity one

k_2 = Weight of peg in relation to commodity two

An additional advantage of this proposal is that weights can be adjusted to benefit one sector relatively to another. This can be applied to a minor commodity sector or it can be extended to other tradables. In terms of diversification, this multidimensional approach allows the addition of a possible manufacturing sector in order to encourage infant industry. The central bank needs to add an additional weight for a specific industry, so that the nominal index becomes

$$S_N = \frac{k_1}{P_{C1}} + \frac{k_2}{P_{C2}} + ... + \frac{k_M}{P_M} \tag{45}$$

And the real exchange rate can be written as

$$S_R = -k_1 \frac{P_{C1}}{P_d} - k_2 \frac{P_{C2}}{P_d} - ... - k_M \frac{P_M}{P_d} \tag{46}$$

where

P_M = Price of the manufactured commodity in foreign currency

k_M = Weight of peg in relation to the manufacturing commodity

In the case of PEPI with the infant manufacturing industry sector, the price of tradable P_T is given by a new version of equation (29) as

$$P_T = \varphi_1 P_{c1} + \varphi_2 P_{c2} + ... + \varphi_M P_M + \varphi_{ot} P_{ot} \tag{47}$$

Thus the RER is given by

$$\frac{1}{S_R} = -\frac{1}{[k_1 P_{C1} + k_2 P_{C2} + ... + k_M P_M]} \left[\varphi_1 P_{c1} + \varphi_2 P_{c2} + ... + \varphi_M P_M + \varphi_{ot} P_{ot} + \alpha\lambda M + \alpha\eta Y\right] \tag{48}$$

The last equation points to the increasing complexity of the formulation, and thus the analysis, of the real exchange rate; it underlines the crucial task of the central bank to define all the weights in order to avoid macro-mismanagement of the economy. However, once the new framework has been established, the PEPI proposal offers a better anchor to inflation (relatively to PEP) and a possible tool to promote diversification by manipulating the weights.

A final shortcoming to this proposal, however, which is relevant to the subsequent discussion, concerns the diversification of the export basket. In the case of Peru, this proposal could have limited applicability since more than half of the export basket has shown similar price trends (they are mainly metals) with significant co-movements.

2.5.4 How financial development influences the two alternative targets

In the development and analysis of the previous proposals there is the assumption that the stabilisation of inflation or the real exchange rate is managed by the balance sheet of the central bank. However, some factors are rather affected by financial development.

The mainstream literature on the effects of financial intermediation on economic activity can be classified into two opposite viewpoints: the empirical growth literature (efficient allocation of savings) and the banking and currency crisis literature (destabilisation and fragility, where monetary aggregates, such as domestic credit, are among the best predictors for crises) (Loayza and Ranciere, 2005). The first view empirically illustrates the positive effect of increases in private domestic credit on GDP (King and Levine, 1993).[17] The second view argues that credit expansion is strongly associated with financial and currency crises (Kamisky and Reinhart, 1999). The two respective sets of policy advocate financial liberalisation on the one side (Roubini and Sala-i-Martin, 1992) and restrictions on the other (Gavin and Hausmann, 1998).

More specifically, with respect to the link between financial development and real exchange rate, capital inflow (outflow) causes real exchange rate appreciation (depreciation) in late 1970s and early 1980s in Chile, Argentina, Mexico and Venezuela (Harbenger, 1985). However, the

[17] Domestic credit is measured by M2/reserves in Calvo and Mendoza (1996).

degree of appreciation varies across countries (e.g. in Latin America more than in Asia) (Calvo el al., 1996); also, less financially developed countries, it is argued, should opt for less flexible exchange rate regimes (Aghion et al., 2006).[18]

The inclusion of the capital flows in the formulation of the exchange rate must be reflected in equation (9), which becomes

$$S_N = -P_C - K + u_t \qquad (26b)$$

where K = capital flows

Thus, there is an extra variable which needs to be managed in order to maintain the stabilisation objectives described above. For this reason, some form of capital control is probably needed. This is well explained by the "impossible trilemma" which postulates the impossible coexistence of fixed exchange rate, total capital mobility and monetary policy independence (Mundell, 1963). Therefore, with a pegged or highly managed exchange rate, the central bank loses its control on interest rates: an interest rate hike would attract capital flows which offset the action of the central bank.

To see how financial development may affects the previous analysis, parameters and ratios of equations (20), (21) and (21b) need to be reconsidered in case of capital mobility:

1) ϕ_2 in equation (21) becomes more relevant as other credit (O) is influenced by capital flows in terms of both quantity and price (rates). Thus, there is a direct influence on money supply.
2) Real income is affected by the change in money supply and its velocity. Financial products may become available, shifting consumer behaviour via inter-temporal choices and wealth effect.
3) Government budget is affected. Counter-cyclical spending will have to take into consideration the impact of capital flows in the economy.

[18] "*the more financially developed a country is, the better it will do with a more flexible exchange rate. The volatility of real shocks relative to financial shocks also matters…"* (Aghion et al., 2006, p.3). On the contrary, the orthodox literature states that greater is the relative volatility the more flexible should be its exchange rate. Financial development is defined as private domestic credit /GDP or liquid liabilities/GDP.

Effects on Frankel's proposal

While the exchange rate is pegged to the export price, capital flows will create an additional element of disturbance. The amount of reserves has to mirror the change in capital flows to maintain the peg, equation (19) becomes

$$R = \tau_1 M + \tau_2 P_C + \tau_3 K \qquad (49)$$

Therefore, the management of reserves becomes potentially even more unstable compared to what was shown in the Table 2.1 (comparison boxes 1) and Table 2.2 (comparison boxes 2) (see the analysis of the term $\alpha\lambda\frac{M}{P_C}$): the volatility of M is affected by both changes in C and R as per equation (20). In addition, the real income Y, and thus the term $\alpha\eta\frac{Y}{P_C}$, is affected by the more unstable nominal money which can cause P_N fluctuation as per equation (24). The conclusion is that some sort of capital control would be welcomed.

Effects on managed RER proposal

The fact that S_N needs to be managed ex-post in order to keep volatility low implicitly points to the idea that capital controls are needed also in this case. However, some capital flows in the form of direct investment can be allowed for the development of the other-tradable sector which is the primary objective of the monetary policy. This may accelerate the process towards a more stable Y.

2.6 The Real exchange rate as a developmental tool: effects on firms investment

Since targeting the real exchange rate appears to be the preferable choice, in this section of the literature review it is worth investigating how the real exchange rate has been seen as a developmental tool. The effects of a managed exchange rate on the development of the economy will be at the centre of the investigation in the empirical part of this thesis.

The literature on the exchange rate as a developmental tool is generally based on equilibrium theories aimed to define undervaluation or overvaluation, low volatility and high volatility. Consequently, there are different views on the allegedly correct competitive real exchange rate level and why this is not delivered by market forces. The theoretical analysis of the channels through which real exchange rate levels could affect economic growth and development is relatively recent. The real exchange rate has not been at the centre of classical economic growth theories (e.g. Lewis, 1954) or the neoclassical growth models[19] or even the Keynesian models (Kaldor, 1957). In reality, the first growth models have been developed for closed economy, and they have just been extended to open economies at a later stage. The export-led growth model adds the distinction between tradable and non-tradable sectors and the impact of demand and supply conditions (Eichengreen, 2008). The introduction of externalities such as spillovers and learning-by-doing overlooked the exchange rate (Frenkel and Taylor, 2006). Also,the developments of intra-country trade flow analysis of Economic Geography did not expand on the role of the exchange rate. In this literature, factor prices and the location of production are important determinants of trade flows (Overman et al., 2001) while the role of exchange rate is not taken into account. The only literature that mentions some theoretical aspects is a recent one that deals with policy advice (Dooley et al., 2005; Bresser-Pereira, 2004; Eichengreen, 2008).

The empirical literature on the relevance of the exchange rate focuses on two main areas, the level and the volatility of the real exchange rate. From this emerges the consensus view that a combination of a stable and competitive exchange rate should enable a country to spur growth and development by capitalising labour force, savings and foreign direct investment (Eichengreen, 2008).

On the one hand, the level of the real exchange rate is considered in relation to a policy orientated toward undervaluation which stimulates export-led growth. The debate on the exchange rate generally addresses the question of what is its correct value which guarantees the maximisation of the rate of growth (Williamson, 2007). The costs are political tensions between countries, accumulation of low-yielding foreign reserves and, possibly, inflation. The level of the real exchange rate may be affected by the particular absorption of the economy due to different

[19] See Romer (1994) for an overview.

spending characteristics of the public sector (which tends to increase more non-tradable prices with infrastructure spending) relatively to the private sector (which tends to increase more tradable prices) (Eichengreen, 2008). Some studies recognise that the depreciation of the exchange rate needs to happen for a significant length of time in order to produce an impact. For example, Rodrik (1993) notices that an induced depreciation in Korea during the 1957-59 was eroded by inflation, but a second and lasting depreciation in 1962-64 had benefits on growth.

On the other hand, the debate around the volatility of the nominal exchange rate evolves on the possible consequences which may discourage trade and investment. However, the link is not proven. Ghosh et al. (1997) find no relation in a sample of 136 countries during 1960-89, and Bailliu et al. (2001) report that a relation exists. More specifically on the RER, a positive relation is reported by Dollar (1992), Hausmann and Gavin (1995) and Belke and Kaas (2004), but this is contradicted by Ghura and Greenes (1993) and Bleany and Greenaway (2001).

The inconclusiveness of these results highlights the difficulties of cross-country studies based on different periods and different ways of measuring the real exchange rate. Moreover, various specification problems may arise: for example, Aghion et al. (2006) combine the effect of volatility with financial fragility as this can have a dramatic cost in terms of growth. Thus, not only volatility matters but the link between volatility and financial development becomes crucial in assigning a role to the exchange rate in relation to growth. Unsurprisingly then, also the literature aimed to analyse only a specific determinant of growth has revealed contradictory responses. For example, on the impact of real exchange rate volatility on investment Ghura and Greenes (1993) and Bleaney and Greenway (2001) find no impact. Instead, Servén (2002) and Aghion et al. (2006), who focus on productivity rather than accumulation, find a negative impact. They agree that the effect is more pronounced for countries with a less developed financial system providing an argument for those supporting finance as a valid provider of hedging instruments.

More specifically, since the 1998 Asian crisis and the creation of the third generation crisis model,[20] the effects of an exchange rate depreciation on the investment decisions of firms has been investigated. This may happen through different channels.

Firstly, a real depreciation can have expansionary effects as it may increase the operating profits of the firms in the export sector. It also increases the costs of the imported goods and therefore favours the tradable activities within the economy (competitiveness effect). This effect depends on the price elasticity of export and imports. If a large fraction of imports is inelastic, the higher costs of inputs and capital goods may offset the positive effects of the export and tradable sector. Empirical literature has given mixed results: Ghei and Prittchet (1999) and Duttagutta and Spilimbergo (2000) show exports increase after a currency depreciation. On the contrary, Agénor and Montiel (1996) and Reif (2001) show the contractionary effects of a real exchange rate depreciation, due to the cost-of-input mechanism Bleakley and Cowan (2002), Carranza et al. (2003).

Secondly, a large real depreciation reduces the networth of firms with a high level of currency mismatch. To expand on this channel, as the risk of depreciation increases, the firm is likely to experience higher costs of borrowing, which is likely to affect investment and therefore aggregate demand. This is defined as balance sheet effect. The Peruvian economy has traditionally exhibited a high degree of dollarisation. This, in fact, involves risks for the economy because it may generate currency mismatches in the balance of economic agents. This issue will be further addressed in the section dedicated to Peru. The theoretical literature on this channel is huge: along the lines of Krugman (1999) and Aghion et al. (2001), these models show, as a common feature, the existence of multiple equilibria. This feature was used to explain the fact that most Asian countries experienced large currency depreciations without ex-ante significant changes in macroeconomic fundamentals. Finally, the depreciation can also create financial

[20] Following Bleakley and Cowan (2002), the third generation models can be classified in three groups. For McKinnon and Pill (1998), foreign borrowing by domestic banks leads to the crisis when the government withdraws its implicit guarantee, while for Radelet and Sachs (1998) the excessive reliance on short term debt leads corporations vulnerable to "panic". Finally, a third group (Krugman 1999a, 1999b; Aghion et al., 2001) sees debt denominated in foreign currency as a key protagonist behind this kind of crises. For these studies the stage for the crisis is set by currency mismatches between liabilities and incomes at firm level. A drop in the "net worth" of the company is then caused by a depreciation of the exchange rate.

stress in the economy as non performing loans may increasingly threaten the stability of the financial system.

Given the theoretical channels through which the responses of the economy to variations of real exchange rate may materialise, the net result out of these different effects is a question that needs to be investigated empirically using firm level data (see chapter 4 and 6). Given the diversity of possible outcomes, it is unsurprising that the empirical findings have been mixed. Bleakley and Cowan (2002) analyse a sample of firms in five Latin American countries during the 1990s and found that firms with dollar denominated debt increased their capital expenditure during periods of exchange rate re-alignment, suggesting that the competitiveness effect may dominate the balance sheet effect. Aguiar (2002) found that the Tequila crisis provoked a severe balance sheet effect which translated into a reduction of investment. An interesting more disaggregated effect is found by Forbes (2002) in a sample of 12 depreciation episodes across different countries: firms with high indebtedness tend to have lower income growth, but exporters have better performance after depreciation.

2.7 Conclusions

This chapter has reviewed the relevant literature for a further investigation of the monetary policy for CDDCs. In particular, it identifies two issues which are predominant: the increasing volatility of commodity prices after the break down of the Bretton Woods system and the partial dollarisation of the economy. However, the mainstream theoretical monetary policy framework adopted by CDDCs was not developed around these issues, but it was inherited from developed industrial countries. In particular, developing countries followed the shift in paradigm adopting the monetarist model at first, and the New Keynesian model more recently. Following the Post-Keynesian critique not only have I highlighted the limitations of both paradigms, but I also showed how particularly weak they are if applied to a partially dollarised economy.

Moreover, the chapter reviewed two alternatives to the IT New Keynesian monetary policy model. The necessity of searching for alternatives is driven by the inadequacy of the IT model in facilitating counter-cyclical policies aimed to reduce the volatility of the business cycle of

CDDCs. In particular, the inclusion of a floating nominal exchange rate offers limited protection against trade shocks and, as a stabilisation mechanism, it is pro-cyclical in nature. IT is not a developmental framework: it does not lead towards an economic development away from commodities.

Therefore, I reviewed two alternative policies which could be better fitted to CDDCs. I compared PEP and RER targeting. Even though Frankel's proposal, the PEP target, is designed specifically for CDDCs and, therefore, has consideration for export prices, it does not achieve domestic price stabilisation and does not provide a solution to the "commodity curse". These problems will be empirically proven in the last part of the thesis in which I run a simulation of PEP and PEPI to Peru. For these reasons, the RER target is a preferable choice.

I reduced the two proposals to similar equations so that they could be easily compared: observing the final forms of each proposal, it is clear that they can be expressed by the same independent variables. This leads to believe that if they are tested by using the same data set, one can get similar results. Any differences would be given by their different constraints. Thus, it is the policy objectives that ought to determine the instruments. Instruments will determine the relevant factors and the theory that will be the basis for the policy. This is the reason why a policy orientated specifically to the stabilisation of the RER is better suited than the PEP proposal, as the final aim is to use the exchange rate not to stabilise the income revenues provided by the commodity sector, but to develop the non-traditional sector and diversify the export sector away from commodity dependence. However, this approach inherits the limitations of the framework developed by Edwards (1985): namely, variable space (tradable, non-tradables), and no significant role for the interest rate with the exclusive consideration of the money supply. Rather, in the new consensus, the role of the interest rate is emphasised (Woodford, 2003).

In conclusion, this chapter argued that designing a monetary policy framework specifically for CDDCs is the right path to follow if one wants to tackle the specific issues related to from such dependency on commodity prices volatility. Furthermore, the chapter also addressed the inability of mainstream economics to conceptualise dollarisation. An alternative way to theorise it is presented in the next chapter and implemented in chapter 5. Finally, the chapter supports

Frankel's main objective. In the remaining part of thesis I will focus on the RER proposal given its developmental potential.

Chapter 3 - A theoretical framework

3.1Introduction

After the literature review presented in the previous chapter, the present chapter sketches out the theoretical framework of this thesis. This refers to the Post-Keynesian tradition.

Since the object of this thesis is an investigation into the developmental role of the exchange rate, it seemed appropriate to start this chapter with the transmission mechanism of monetary and fiscal policies. In the next section, an adaptation of this transmission mechanism is presented. The adaptation is necessary in order to account for the peculiarities of CDDCs where a prominent role, within the evolution of the business cycle, is played by commodity price volatility.

Within the macro-management of the commodity business cycle, however, it is also important to have a theoretical framework able to interpret two of the most pressing issues for a small open economy whose income largely depends on the export of one or a few primary commodities. One of this refers to a recent development of the derivatives on commodities market, namely the transformation of commodity futures into an asset class. Some impressive data about this development have been highlighted in the introductory chapter. This chapter contextualises it within a Minskyan framework.

The second issue refers to the older phenomenon of dollarisation. The relevant literature has been reviewed in the previous chapter where it was discussed in relation to the volatility of commodity prices. In the third sub-section, dollarisation is conceptualised in terms of liquidity preference, and an original categorisation distinguishing internal and external liquidities is presented.

Overall, then, next section provides an illustration of the theory supporting the empirical chapters in tackling the question on how the Peruvian central bank deals with price volatility, dollarisation and liquidity.

The above discussion, however, remains abstract, despite the attempts, within the chapter, to integrate it with actual examples. As a result, this theoretical framework needs to address the question of *how* the management of the exchange rate can be an effective developmental tool. The third section concentrates on this aspect providing a theoretical account of the various channels through which the exchange rate can be used as an actual developmental tool. These are the labour channel, the external balance channel (both considered for the sake of completeness, but not addressed in the empirical part) and, finally, the finance channel. The latter one is conceptualised in Miskyian terms and will form the theory underpinning an analysis of the stabilisation of Peru in the first empirical chapter. Additionally, this channel will be further investigated by analysing micro data of 117 non-financial firms in the second empirical chapter.

Finally, the fourth section of this chapter draws a summarising conclusion.

3.2 The macro management of the commodity business cycle

This section sketches out the theory of reference used to interpret the peculiarities of the Peruvian economy. The first sub-section addresses the transmission mechanism of monetary and fiscal policies and the corresponding challenges the country faces in periods of booms and busts. However, an attempt to draw a comprehensive theoretical framework cannot underestimate two further issues which may be conceptualised, to use the Minskyan taxonomy, as additional sources of fragility, namely, commodity derivatives as a new asset class and dollarisation.

3.2.1 Transmission mechanism of monetary and fiscal policies in a CDDC

I depict the transmission mechanism of monetary and fiscal policies in a typical CDDC in a diagrammatic form in Figure 3.1 This shows the macro mechanisms involved in a commodity cycle. The starting point is the middle area which reflects the centrality of commodity prices; the upper part describes the links with fiscal policy and the bottom part shows the links with monetary policy. Initially, it is important to distinguish between various types of commodities not only because commodity prices have different cycles and volatility patterns, as discussed in

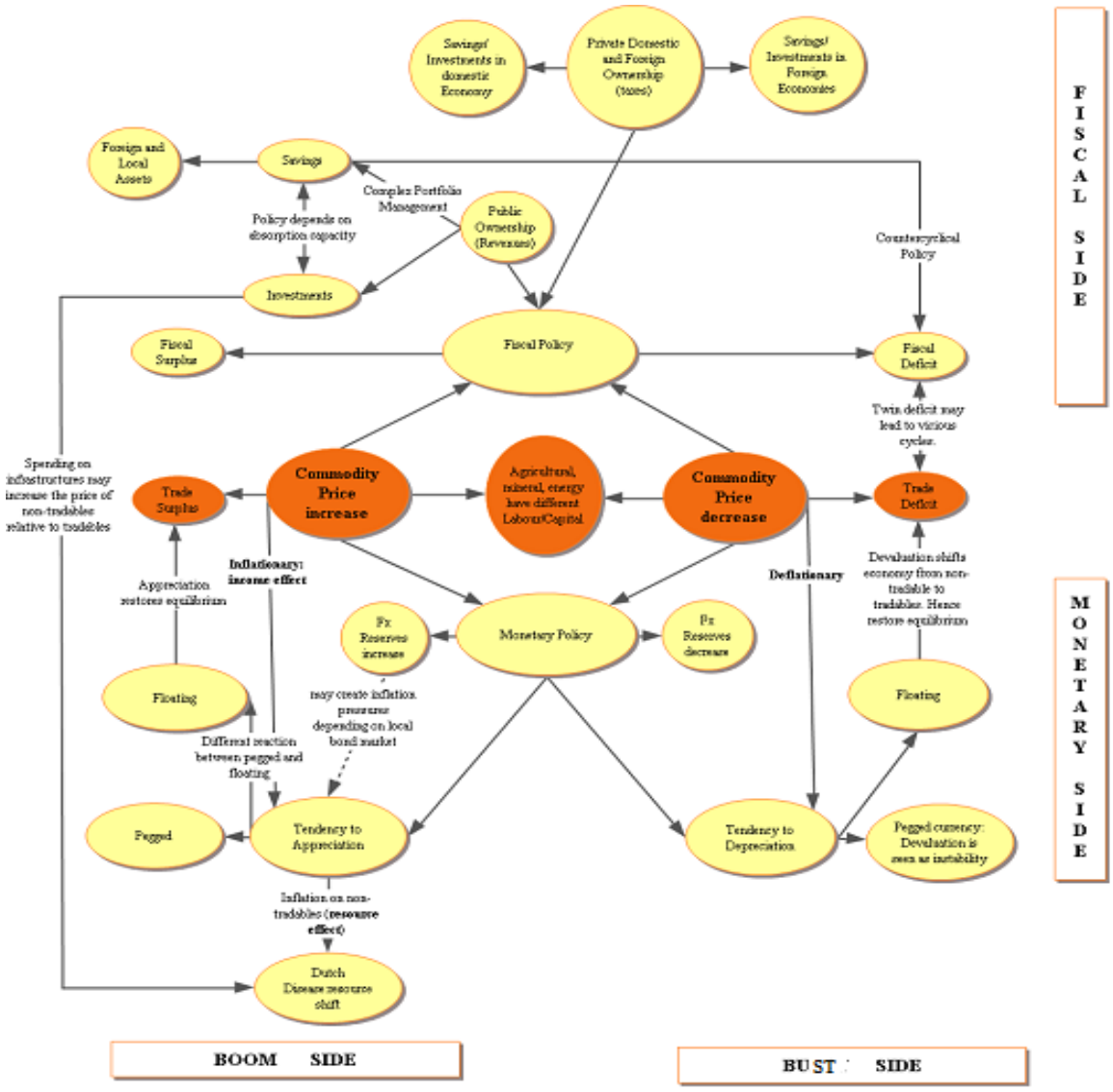
the previous chapter, but also because they are produced with different labour to physical capital ratios. Moreover, the commodity sector may be privately or publicly owned and in the hands of domestic or foreigner owners.

The cycle is generally driven by the price of one or more exported commodities: a boom is visible in left hand-side and a burst on the right-hand side of Figure 3.1 (next page). Here, boom and bust refer to commodity prices; this language is considered appropriate because commodity prices tend to follow the dynamics of financial markets as theorised in the next sub-section.

Let us consider the boom. First, despite the unsuccessful experiences of many CDDCs during the 1970s and 1980s, commodity booms are seen as a good opportunity for growth, since, generally, they improve the trade balance (Bevan et al., 1999; Adam et al., 2004). The chain sequence of commodity prices, increase of commodity prices and trade surplus is shown in Figure 3.1 moving from the centre to the left. The importance of macro-management policies seem to be even more relevant during a boom in terms of opportunity to permanently increase income (Dehn, 2000).

Nevertheless, the first issue a CDDC country faces in the presence of a commodity boom is related to its spending ability: a sudden increase in export receipts may reveal absorptive capacity bottlenecks which lead to the key issue of drawing the line between savings and investment. The domestic economy should absorb the increase of income gradually and then use it effectively over an extended period of time. The risk is that the windfall is spent in low-return investments and the economy is not able to use it appropriately (Nissanke, 1993).

Figure 3.1: Transmission mechanisms of commodity prices into monetary and fiscal policies



Second, different issues arise depending on whether the windfall is spent by the private or by the public sector (Bevan et al., 1999). The private sector's spending will cause the so-called *income effect* (on the left side in Figure 3.1), which may create inflationary pressure in the non-tradable sector as the import price of most of the tradables is determined outside the country.[21] Also, the appreciation tends to cause a resource shift (*resource effect*) from the tradables to the now more profitable non-tradable sector. An analysis of both tradable and non-tradable sectors will be carried out in the second empirical chapter in which the different profitability of the two

[21] However, in contrast with the prediction of the Dutch disease literature (see for example, Corden, 1984), the inflationary pressures may not materialise in the absence of short-term supply bottlenecks (Nissanke, 1993).

sectors will be shown. On the contrary, if the public sector is able to appropriate the windfall, it may trigger euphoria which will lead to a domestic credit expansion to finance public expenditure, and will cause a further appreciation of the exchange rate if the government spends on non-tradables (Nissanke, 1993).

Third, the left top part of Figure 3.1 addresses the saving of the windfall. As a way of implementing saving policies, since the 1990s, many countries have established Commodity Stabilisation Fund (CSF) to be used as fiscal countercyclical buffer during bust times.[22] In general, if the windfall is saved, part of this saving may be allocated to foreign assets: domestic investment can only be directed towards real assets, given the limited development of the financial sector (Collier and Gunning, 1999; Masson and Pattillo, 2005). This should be considered within a more general issue of inter-temporal optimisation: these countries face a complex issue of portfolio management with many dimensions, since optimisation is about domestic/net foreign investments and liquid financial/real productive assets within an open economy context of current and future risk/return space.

Fourth, as shown on the left bottom side of the figure, the central bank can intervene in the foreign exchange market to limit the appreciation of the currency, and, with respect to the other side of its balance sheet, the central bank should sterilise these interventions by issuing local bonds to avoid inflationary pressures. However, a shallow local financial market limits this policy instrument: interest rates can rapidly increase as a consequence of sterilisation leading to higher debt service costs (Dehn, 2000; Adam et al., 2004). These issues will be considered in the first empirical chapter.

Fifth, in terms of fiscal policy, the upper part of Figure 3.1 shows how the volatility of commodity revenues may create serious challenges for the country. Government investments tend to exceed savings accumulated during boom periods, and expenditure is only reduced at a very late point during the burst when its impact on the economy becomes too harsh. As discussed under the second issue above, ownership of the commodity sector is crucial: if it is publicly owned, its revenues are direct; if it is privately owned, its revenues tend to be lower and accrued

[22] Generally, these funds consist in assets held in commercial banks in foreign currency or hold in reserve deposit at the central bank (Fasano, 2000).

via taxation; in case of foreign ownership, profits are normally repatriated. Generally, the ownership, and the associated dependence on the external balance, underlines the difficulty of budget planning.

Let us now consider the busts. First, the decline in price has immediate negative consequences on the trade balance and on government revenues too. Second, when financing is mostly needed, capital markets become less liquid and credit more expensive as the country credit rating deteriorates. Debt management tends to show a pro-cyclical pattern which results in disruptive consequences: at the height of the boom, the international capital market is flooded with capital and liquid assets, the CDDC shows high credit worthiness and a correspondingly high value of its currency: it is at this time that debt is incurred. In a similarly pro-cyclical fashion, the bust proceeds overwhelmingly: sharp depreciation and low credit rating makes refinancing and debt rescheduling very expensive or even impossible, given the country's over-leverage (Nissanke, 1993).

Under these conditions, the fiscal deficit can be financed by the central bank surrendering its independence (Jha, 2001). The bottom right of the diagram shows how currency reserves are generally used to avoid currency depreciation, especially if the exchange rate is pegged, to avoid the instability caused by devaluations. Even in a floating exchange rate regime, the central bank may either use reserves to avoid depreciation and/or it can rapidly increase interest rates in the attempt to avoid deterioration of foreign investor's sentiment and sudden stops (Calvo, 1998). However, an orderly depreciation of the exchange rate is supposed to bring back the trade balance to surplus.

As anticipated in the introduction of this chapter, there are two crucial phenomena which affect volatility of commodity prices and the monetary side, at the centre and the bottom of the Figure 3.1 respectively. These are the recent developments of the market of commodity derivatives and dollarisation which will be addressed in the next two sub-sections respectively.

3.2.2 Commodity Futures as an asset class

The analysis of the price fluctuations of the latest commodity cycle, and in particular of the 2003-2010 boom, reveals how commodity markets appear to have changed once more. Consequently, the literature reviewed in the previous chapter does not provide a satisfactory answer; a new theoretical framework which involves the role of financial markets is needed.

More generally, the recent expansion of financial markets is here assumed to be part of the general evolution of capitalism in different stages. The current stage is said to be dominated by "managers of funds" (Minsky and Whalen, 1996). Their necessity to hedge against financial risks, such as rises in interest rates or exchange rate movements, drives money managers' search for new asset classes. An asset class is defined as a category of assets, a collection of securities which show analogous characteristics, behave similarly and are often subject to the same regulation. These may be cash equivalent, stocks and bonds. The increase in trading of commodity derivatives .since the early 2000s, which was described in Chapter 1, and the transformation of these instruments into a new asset class have been related to two possible causes: first Masters and White (2011) report that institutional investors have increasingly used commodity futures to hedge against equity risk. Nevertheless, they argue that while commodity derivatives were natural hedgers against inflation, their hedging against equity has been less effective. The second cause is the search for higher yields in an environment characterised by low interest rates (Masters and White, 2011).

As a result, the commodity futures market can be looked at as an example of a new asset class: traditionally, the market was used for commodity producers and consumers in order to hedge against future price movements. Today, a significantly increasing part of the total value of the commodity future contracts is in the hand of money managers. The result is that the characteristics, in terms of price movements and volatility, of the underlying physical commodity markets are subject to the financial market as a whole (Masters and White, 2008; Wray, 2008). This process can be described in terms of financialisation of a market operated by money managers (Wray, 2018). Financialisation is defined as "a process whereby financial markets, financial institutions, and financial elites gain greater influence over economic outcomes" (Palley, 2007, p. 1). The Unctad Trade and Development report (2009) describes the

financialisation of commodity markets in the terms of the presence of financial investors on commodity future exchanges.

For a deeper analysis of this transformation and its effects on CDDC, it is necessary to investigate the behaviour of the actors involved, the money managers, the transformation of the marketed asset, the commodity futures, and their effects on the underlying asset, the physical commodity.

First, there are mainly two groups of financial investors, active managers and passive index managers. While the first group has been around for many years, the latter group is relatively new and, with the injection of large funds in recent years, has contributed to the boom (Master and White, 2008). The effects have been extraordinary. The number of future and option contracts outstanding on commodity exchanges has increased about five fold and the notional amount of outstanding over-the-counter commodity related contract increased of about 20 times during the same boom period (UNCTAD, 2009). This indicates how commodity derivatives have become a new asset class.

Second, the identification of a new asset class by financial investors depends on a series of factors related to the way in which financial investors act and on the circumstances of that specific market. The interaction of these two sets of factors changes over time and indicates how markets do not exist in abstract but have a concrete evolution that needs to be investigated (Minsky, 1986a). On the one hand, on the financial side, the commodity market has become particularly attractive after the severe equity bear market of the period 2000-2002. De-regulating policies and "financial innovation" interacted in the Minskyan way: Minsky witnessed what he dubbed as a "deregulation mania" (Minsky, 1986a, p.198) during the 1980s which "eliminated the regulations that once restricted competition among institutions, instruments, and markets" (Minsky, 1986b, p. 12). At the same time, Minsky was aware that financial innovation had "greatly increased the kinds of assets and liabilities available to banks, other financial institutions, and financial markets. As a result, the connections between financing instruments, prudential regulations…have changed (Minsky, 1986b, pp. 12-13). This change of the financial structure

contributed to the evolution of capitalism into its present stage of money-manager capitalism (Minsky and Whalen, 1996, p. 3).[23]

Wray (2008) employs Minsky's analytical framework to analyse the financialisation of the market of derivatives on commodities operated by money managers: thanks to the deregulating effort of the Commodity Futures Trading Commission in the US, money managers innovatively extended their asset class selection to existing financial instruments, namely derivatives on primary commodities (Wray, 2008).[24] This allowed the pervasiveness of financial markets to create a new asset class. The results are a diffuse usage of swap contracts between investors and investment banks, and the cancellation of speculative position limits.[25] Furthermore, traditionally, the derivatives on commodities have been considered as a natural hedge against inflation, since energy and food prices have a strong component or secondary effects on consumer price indexes. Derivatives on commodities have also shown a low correlation with bond and equity markets (Gorton and Rouwenhorst, 2005). However, its low correlation with other markets was also due to its under-utilisation by financial investors: the overall historical size of the market in terms of total nominal size of transactions has been marginal relatively to bond and equity markets.[26] But this lack of correlation has tended to fade with the expansion of the market, since investors exploited the new asset class in order to *"make on the carry"* (Minsky, 1986a, p. 211).

On the other hand, on the real side, commodity derivatives have been chosen as a new asset class by speculators also because the underlying physical commodities were experiencing a boom since 2002. Their price increase was expected to support prices in the derivative market. This market was used, until then, only by producers and traders of the underlying commodity to hedge the price risk. Empirical evidence supports the idea that there is always a "fundamental" reason on which the financial market builds its euphoria (Minsky, 1986a). In fact, both exchange-

[23] The American economy was initially in a stage of commercial capitalism "during which external finance was used mainly for trade, this structure has evolved into its present stage of "money manger capitalism, where financial markets and arrangements are dominated by managers of funds" (Minskyt and Whalen , 1996, p .2)

[24] In this case the innovation was not an instrument innovation; it was an innovative use of an existing instrument.

[25] During the 1990s, at the peak of money-manager capitalism, the Commodity Futures Trading Commission (CFTC) granted Wall Street firms exemptions from speculative position limits, by which banks were allowed to hedge over-the-counter swap transactions (CFTC, 2007).

[26] The under-utilisation of a market may be due to different characteristics of the underlying commodities, especially high transport and storage costs.

traded commodities and non exchange-traded commodities, commodities not included in commodities indexes and traded over-the-counter, have seen a major increase in price (UNCTAD, 2009). Nevertheless, generally, once the market expands, its low correlation with other markets tends to fade: the recent sub-prime crisis has unveiled an increasing correlation between price movements of bonds, equities and commodity derivatives (Silvennoinen and Thorp, 2010).

Third, the dramatic increase in both the physical and the financial commodity prices leads to the question of whether the derivative market has driven the spot price up or vice versa. The most popular explanation for the price increase of the physical commodity is given by the "fundamental" imbalance between demand and supply originated by the growth of China and, to a less extent, of India, which caused metal and energy prices to rise (Gros, 2008). Geopolitical factors, such as the Middle East crisis, have contributed to the increase in energy prices too (Winters and Yusuf, 2007).

Finally, the physical market is subject to speculation as well. For example, Wray (2008) mentions how British Petroleum monopolised 90 percent of all TET propane supplies withholding some quantity off the market to drive prices up. Previously, Veneroso (1998) reported one million metric/tons (out of the 17-18 million produced every year) of copper missing, disappearing into un-recorded inventories in China.

To conclude, in the recent history of commodity markets, two phenomena have a particular significance. Firstly, the disappearance of price commodity stabilisation policies and the reliance on market forces to determine prices: the post Bretton-Woods era has developed significant price changes in terms of both volatility and trends. This phenomenon has been reviewed in the previous chapter. Secondly, this chapter has shown that through financial innovations and de-regulation, the commodity futures have become an investment asset class. As a result, the participation of money managers has aligned this new asset class to equities and bonds in such a way that it has assumed their typical characteristics associated to booms and busts, including volatility and pro-cyclicality.

The above discussion was necessary to explain the increased volatility of commodity prices which, in general, has crucial effects on the transmission mechanism of monetary and fiscal policies, by influencing the central part of Figure 3.1. Now, I turn to the issue of dollarisation which affects the entire lower part of Figure 3.1.

Finally, it is necessary to consider, with respect to exchange rate dynamics, the issue of financial and currency crises: Harvey (2009) considers three situations which can lead to strong exchange rate depreciations: first are deviations of the actual exchange rate away from agents' mental model; second, deviations of the returns on financial assets from returns real returns (this is derived from Keynes); third, agents raise short-term and foreign loans increasing debt to income ratios along the Minskyian financial fragility.

3.2.3 Dollarisation as an issue of liquidity and structure of the economy

The previous chapter addressed the limitations of the literature in conceptualising dollarisation. This is particularly relevant for the Peruvian economy since the dollarisation of broad money (measured as a ratio of broad money) has been consistently high in recent history: it was 65 at the beginning of the 1990s, reached 70 at the turn of the century and it is now at around 40. Since dollarisation is an issue for the effectiveness and the autonomy of monetary policy, it is important not only to investigate its causes but also its possible remedies. As a result, this thesis considers dollarisation as a complex and multi-dimensional phenomenon: this section, first, assumes that dollarisation is determined by demand and supply of foreign currency; second, it defines dollarisation with respect to two dimensions of liquidity, namely, internal and external.

On the demand side, dollarisation can be considered with respect to the Keynesian liquidity preference:

"Thus if currency notes were to be deprived of their liquidity premium by the stamping system, a long series of substitutes would step into their shows – bank-money, debts at call, foreign money, jewellery and the precious metals generally, and so forth"(Keynes, 1997, p.358)

In contextualising the demand for money in an open economy, this chapter considers Kregel (1982), who, in interpreting Keynes's work, explains how the liquidity preference, i.e. the preference for sterling, influences the decision to take positions in foreign currency assets in terms of their spot and forward prices relatively to the domestic (sterling) prices. The domestic currency is an asset class and its demand is determined by its net return relatively to other currencies. Like the interest rate is determined by the market premium for liquidity within a closed economy, so the exchange rate is determined by the net return relatively to a foreign currency.

The net return of holding an asset can be expressed in term of the asset itself or in terms of another asset. In the first case, the benefits are determined by the yield (the satisfaction of holding and/or the capacity to produce the asset), the cost of carrying (the need to store the asset), and a liquidity premium (the security of disposal in terms of its marketability) (Chick, 1983).

In the second case, the comparability between asset returns needs a common denominator, a single money standard, the use of which implies the consideration of an expected appreciation of the assets in terms of the money standard. It is in these terms that wealth holders can choose within a range of assets defined in the dimensions of yield, liquidity and carrying cost (Kregel, 1982).

Notably, liquidity preference is related to time and, with it, to uncertainty. Post-Keynesian exchange rate theory emphasises the role of expectations and short-term financial flows (Chick, 1983, Harvey, 2001, Dow 2002). For Harvey (2009) expectations are formed under fundamental uncertainty, so they are context and time specific. Famously, Keynes indicated three motives for demanding money: the transaction motive (similar to the neoclassical view of money, Minsky, 1986a), the precautionary motive, *"the desire for security as to the future cash equivalent of a certain proportion of total resources"* (Keynes, 1997, p. 170) and, finally, the speculative motive, *"the objective of securing profit from knowing better than the market what the future will bring forth"* (ibid.).

With respect to the definition of dollarisation, the precautionary motive, as further defined by Keynes, seems very appropriate:

"To provide for contingencies requiring sudden expenditure and for unforeseen opportunities of advantageous purchases, and also to hold an asset of which the value is fixed in terms of money to meet a subsequent liability fixed in terms of money, are further motives for holding cash" (1997, p.196, my emphasis).

Within the above discussion, the demand side of dollarisation can then be interpreted in terms of liquidity preference, as a shift from a money asset into another money-asset. This should not be confused with asset-side dollarisation discussed in the previous chapter. Rather, here dollarisation can be also explained in terms of holding an asset to meet "subsequent liabilities".

With respect to an open economy, Dow (1987) incorporates two main features of Keynesian monetary theory: the instability of expectations and the role of money as a refuge from uncertainty. Accordingly, the economic cycle depends on changes in expenditure based on changes in the marginal efficiency of capital (MEC). Finance is crucial in investment planning and depends on the liquidity preference of financial institutions. A downswing is characterised by a run towards liquidity (i.e. higher liquidity preference), stimulated by expectations of falling asset prices. More precisely, the demand for money increases significantly, while the liquidity of non-money assets declines, when the market becomes less active and capital losses emerges. The current flow of money may be insufficient because banks do not longer extend credit because of businesses' capital losses.

On the contrary, during an upswing, liquidity preference declines as the asset market becomes more active and capital gains are expected. When this phase continues, then cushions of safety in exercising finance are reduced and financial fragility increases (see also Kregel, 2008). Financial markets amplify the swings in the MEC. Thus, optimistic expectations are dangerous when financing is highly geared. Higher interest rates set by the central bank can be the cause of collapsing confidence in highly speculative markets, which would erode the capacity of banks to provide further finance (Minsky, 1986a).

When applied to a small open dollarised economy, this overall framework can be used to explain two peculiar issues. A possible shift between domestic and foreign currency denominated assets and non-money assets further complicates the picture. By holding dollar cash balances, the

responsiveness of the demand for domestic money to changes in domestic liquidity decreases. Also, the demand for liquidity is less sensitive to expected returns in comparison to a closed economy: for example, domestic non-money assets can be switched to foreign non-money assets in case of expected lower returns. Furthermore, an economy with consistently higher expected returns relatively to other countries, will attract capital inflows regardless of the liquidity preference of financial institutions (that is tighter financing conditions) than other countries (Dow, 1987).

In case of dollarisation, then, the economy has to deal with two sub-sets or forms of money liquidity, one in domestic money and the other in foreign money. Their interaction gives rise to complicated patterns of liquidity preference.

Dollarisation creates a hierarchy of assets: Peruvian soles are the riskiest with both country- and currency-risk; internal dollar-denominated assets carry country-, but not currency-risk; finally, external dollar-denominated assets, i.e. assets held by Peruvian residents abroad, carry neither of the two risks. As a result, whenever there is a situation of uncertainty, during hyperinflation or during international financial turmoil, there is a run towards less risky assets with conversion of soles into internal dollar-denominated assets and from internal dollar-denominated assets towards external dollar-denominated assets. Therefore, returns in dollar on both financial and real assets can be fully realised only if taken outside the country.

On the supply side, domestic liquidity depends on the central bank, by supplying money to the banking system, on the agents who switch in and out of the domestic assets and, centrally, on the international dollar-liquidity. Of course, the degree of openness, that is the size of the trade and financial account, determines the flows and supply of foreign currency in the economy.

Changes in expectations on exchange rate influence the liquidity of domestic money and, consequently, the dollar liquidity in circulation (Dow, 1987). The degree of rigidity of the exchange rate, ranging from pure fixed to pure floating, not only influences the domestic independence of the monetary policy, but it also accounts for the presence of the central bank in its daily activities in the foreign exchange market. The more the central bank intervenes, the more the spot/forward price is guaranteed on each side of the transaction, and the more liquid is the

exchange. The problem of fixed exchange rates then is to guarantee the size rather than the price of the transactions, thus currency crises happen when the exchange rate is no longer credible because of low central bank' reserves. On the contrary, in a floating exchange rate regime, the balance of payments does not have an impact on money supply even though the exchange rate has indirect effects on the supply of liquidity. As a result, firstly, inflation changes through import prices and consequently alters the real value of money supply. Secondly, even though the nominal transactions in the foreign exchange market cancel each other, they may have different maturities. So, for example, foreign purchases of domestic long-term assets matched with domestic purchases of deposits in foreign banks represents a decrease in domestic liquidity (Dow, 1987).

The above discussion is needed to highlight the point that, between the two extremes of pegged and pure floating, the central bank can identify its space and guarantee exchange rate liquidity when it is needed. In terms of monetary policy choice, the intervention in the foreign exchange market *"...is not a special case but rather a logical necessity, arising out of the nature of money and finance..."* (Moore, 1988, p. xi).

Nevertheless, liquidity is very complex to define. It has various forms and degrees (Nesvetailova, 2007). In the reminder of this section I sketch out an original categorisation based on the divide between internal and external liquidity which may be particularly relevant for the theory underpinning this thesis. Liquidity can be in domestic currency and foreign currency, expressed in assets and liabilities.

Now, assets and liabilities are related, as assets may have to be liquidated to pay for liabilities and liabilities issued to finance the accumulation of assets. The notion of inside and outside money in the private or in the public sectors can help to explain this dynamic: bank financing of the private sector by purchasing new claims is defined as creation of inside money, while outside money is issued in exchange of government securities, foreign assets or fiat money (Gurley and Shaw, 1960).

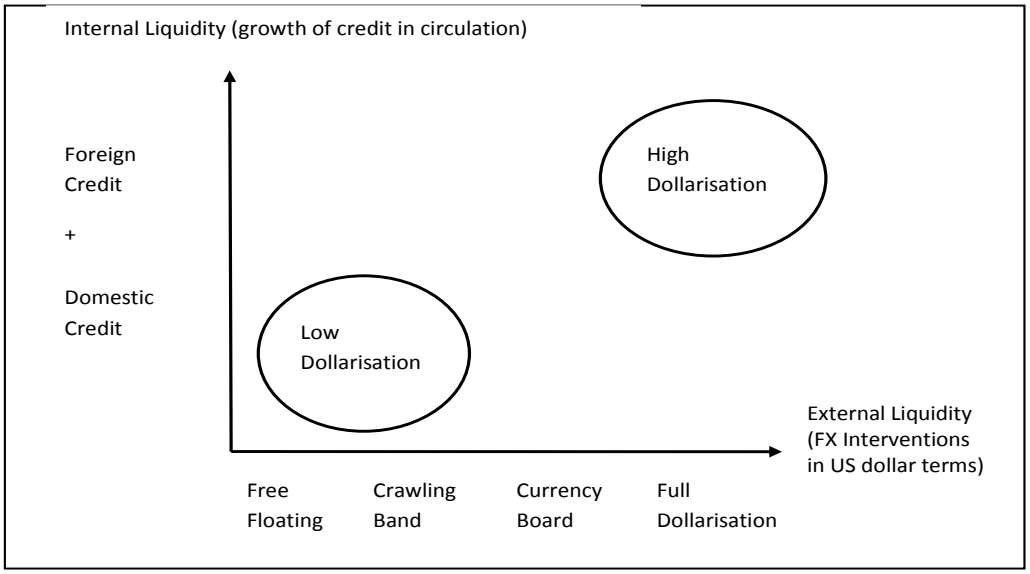
The following definition of liquidity is relevant to the above mechanism:

"If a desire to increase spending were to lead the private sector in aggregate to attempt to liquidate its claims, and if all those claims were claims on other members of the private sector, these assets would not be liquid: the outsideness would be part of the source of liquidity" (Chick, 1973, p.81).

For this reason, dollarisation can be thought as a form of "outsideness" with respect to liquidity: if dollarisation decreases liquidity in domestic currency, then keeping the exchange rate stable may be seen as a way to get part of that liquidity back.

Thus, the liquidity that the central bank is in charge of can be analysed along two dimensions, internal liquidity and external liquidity related to the foreign currency market (Figure 3.2): internal liquidity is given by credit circulating in the banking/financial system, which can be divided into local currency and foreign currency (vertical axis). For the supply of credit the role of interest rates is crucial in relation to the relative profitability of assets and the liquidity of lenders' portfolios. External liquidity deals with the exchange rate regime. The less flexible the exchange rate is, the more the central bank intervenes, the more the relative liquidity between the two currencies is guaranteed (horizontal axis).

Figure 3.2: Monetary policy following the definitions of internal and external liquidities



The higher the dollarisation in the economy, the higher the percentage of credit of foreign currency relatively to domestic-denominated credit on the vertical axis, the more rigid the exchange rate has to be in order to guarantee liquidity in the foreign exchange market. In the first empirical chapter, this chart will be drawn for Peru. This will provide an additional framework in analysing the monetary policy of the Peruvian central bank. More specifically, external and internal liquidities are associated to the business cycle, they are both determinants of, and determined by, it. Chapter 5 shows how they move according to international financial market behaviour and relatively little controlled by the Peruvian central bank.

In the presence of dollarisation, the transmission mechanism of the monetary policy may change: an increase of the interest rate activates a switch from dollars towards soles, however, in the case of dollarisation, this possible switch is counter-balanced by the precautionary motive, because of which the public tends to hold more dollars.

Nevertheless, because of the challenges it poses, dollarisation is often undesired, as discussed in the previous chapter. However, once an economy is dollarised, then it is too simplistic to prescribe a solution based on a floating exchange rate and on the development of a liquid domestic bond market. The difficulties related to de-dollarisation are direct consequences of its complexity. As shown in the previous sections, the higher the dollarisation in the economy, the less effective the monetary policy becomes, and this effect cannot be minimised only by stabilising the exchange rate. This thesis argues that de-dollarisation may only be achieved once the economy moves towards a more stable growth path. This argument will be taken up in the concluding chapter.

3.3 RER as a tool for development and its channels

In the previous chapter, the management of the RER has been identified as a policy tool to diversify the export sector away from commodity dependence. From a theoretical point of view, following Frenkel and Taylor (2006), I can identify three main channels by which the RER can affect the economy: labour (real wages), external balance (imports and exports) and finance (external debt).

3.3.1 Labour Channel

This sub-section briefly sketches the research directions regarding the labour channel just for the sake of completeness: for reasons of space and focus, however, this channel is not investigated in the empirical part of this thesis.

First, this channel focuses on the effect of RER on real wages. For a given productivity levels, saving and investment are a function of real wages, which in turn depend on the exchange rate (Bhaduri and Marglin, 1990). In this way, while both Keynes (1997) and Kalecki (1939, 1971) consider real wages as an endogenous variable in a closed economy, it is possible to explore the case of an open economy in which the real wage rate becomes exogenous. The Kaleckian mark-up pricing rule is still valid: the higher the mark-up, the lower the real wage, the higher the share of profit. Therefore, similarly to the case of a closed economy, there are two possible conclusions depending on the elasticity of investment to changes in profit margins (Bhaduri and Marglin, 1990). However, it is worth noting that the above is a particular interpretation of the Kaleckian mark-up: alternatively, the average mark-up is considered to be determined by the amounts of investments, the fiscal deficits, trade surplus and capitalist consumption. The Kaleckian mark-up can be seen as a mark-up on "prime" which is labour and raw material (Mair et. al., 2002)

If investment is irresponsive to changes in profit margins, a lower real wage (depreciation) is recessionary because the decrease in consumption does not compensate investments (the under-consumption thesis). On the contrary, higher real wage (appreciation) compensate lower investments (consumption-led growth), but it is capacity-constrained in the long-run. If debt is used to finance consumption then it may be considered as savings displacement (Bresser-Pereira, 2004). If, on the contrary, investment is elastic to changes in profit margins, then lower real wages increase profits and investments, which in turn benefit from higher demand and, as a consequence, capacity expands (investment-led growth).[27] Therefore, given a change in real wages, the different time lags to the adjustments in consumption and investment determines the outcome.

[27] This depends on the size of the domestic market versus the foreign trade sector. Domestic market is generally relatively small in CDDCs.

The second aspect to consider beside the effect of RER on the level of real wages is that on employment. Frenkel (2004) recognises two main channels. Firstly, the macroeconomic channel which has a short-term influence of RER on the level of activity and employment (this is typical of orthodox theories). For example, a more depreciated RER encourages a more intensive use of labour given the relative price gains of this factor measured in foreign currency. Secondly, the development channel which explains the long-term influence of RER on output growth is reflected on investment in tradable activity (Williamson, 2007; Rodrik, 2003). For instance, a more depreciated RER stimulates tradable activities and increases their profitability; Rodrik (2003) identifies two main developmental effects of RER: an initial push for growth in the short-run and a more sustainable growth in the long-run depending on institutions. Frenkel (2004) adds an additional channel, the unemployment channel. This explains the influence of RER on labour intensity of output mainly in the tradable sector. This happens in the short-term as consequence of shifts in relative prices due to changes in RER: in the short-term there are three main price changes: (1) the labour/capital goods price ratio is considered because imported capital goods are a very significant share of imports; (2) the imported inputs/labour price ratios; (3) the price of wages measured in foreign currency (very important in tradable sector). In addition, it is important to notice that the RER also influences the non-tradable sector as employment/output ratios are still given by the shifts in relative prices. This happens especially when imported capital goods are used by the non-tradable sector.

3.3.2 External Balance Channel

The discussion about the responsiveness of investment to profit changes of the previous sub-section can be integrated by adding the elasticities of exports and imports in order to include the effects of the exchange rate on revenues and imported input prices (Bhaduri and Marglin, 1990). [28] Since tariffs and subsidies are relatively less used in recent times, the exchange rate has become more relevant in contemporary trade policies.[29]

[28] Changes in the nominal exchange rate impact the price of imports and exports.

[29] Using the same variables defined in the previous chapter:

$P_{im} = P_I S_N (1-t)$ (1)Where t = tariff

Thus, the effect of the exchange rate on investment depends on the time lag between the changes in real wages and the changes in exports/imports.[30] The conclusion is that, through devaluations, capacity utilisation can only increase in an *exhilarationist* regime (investment/profit-led growth) in which real wages are repressed and profits are boosted by an increase in price competitiveness. On the contrary, the effect is ambiguous in a *stagnationist* regime (consumption/wage led growth). Furthermore, the more open an economy is the more the trade effect provides an *exhilarationist* feature. This analysis remains limited to the short-term horizon and does not considers the dynamic case in which both capacity utilisation and real wage/profit share are endogenous, that is the case of non-linear IS schedule if we want to use textbook terminology.

The second empirical chapter of the thesis will investigate the effect of devaluations on investment (competitiveness effect) for non-financial firms within the Peruvian economy.

3.3.3 Finance Channel

Currency mismatches in the balance sheets of firms determine the effects of exchange rate movements.[31] A firm suffers from currency-mismatch if a significant fraction of its debt is in foreign currency, and its flows of income as well as its assets are mostly in domestic currency. In such a situation, a significant depreciation deteriorates the firm's net worth (balance sheet effect). This affects investment and, consequently, aggregate demand. From the theoretical point of view, Minsky (1986) can offer a valuable insight for the analysis of the dynamics of firms' balance sheets.

$P_{im} = P_I S_N /(1-s)$ (2) Where s= subsidy

[30] The changes in exports/imports due to change in the exchange rate may depends on the Marshall-Lerner condition (1944): starting from a position of equilibrium in the current account a devaluation will improve it if the sum of the price elasticity of demand for imports and that of exports is greater than one. Vice versa, if this sum is less than one, devaluation will deteriorate the current account. The model was improved by Stern (1973) by relaxing the assumptions of less than infinity supply elasticity and initial balanced trade.

[31] The literature on currency mismatches has been confusing for some time; the following quote clarifies the issue: *"Original sin is the inability of a country to borrow in its own currency. In contrast, the literature on currency mismatches, as we read it, is concerned with the consequences of these problems"* (Eichengreen et al, 2003, p. 21).

Famously, Minsky (1986) defined three financing postures: hedge, speculative and Ponzi. Hedge financing is a position in which a firm's expected cash flows always exceed the financing costs and operating expenses and its margins of safety are quite wide. A firm is in a speculative position if its net present value is positive, but its expected cash flows are not sufficient to meet all financial commitments in all periods. Finally, Ponzi financing is the posture in which a firm has to borrow funds just to meet its current cash flow commitments, including the payment of interest on its outstanding debt.

A firm's financial position can change form hedge to speculative and eventually to Ponzi if macroeconomic variables changes, in a closed economy, typically, if the interest rate changes. Increasing interest rates can do so by reducing the present value of the firm's current cash flow and increasing its cash flow commitments. A creditor bank will typically respond to a deterioration of the financial position of its debtors by reducing its lending. Firms will then be forced to sell their assets to meet their current cash flow commitments precipitating the economy into a debt-deflation crisis. Minsky developed this theory in a closed economy context. Since then, Kregel (1998) and Arestis and Glickman (2002) developed this view in an open economy context: the above scenario could also result from a depreciation if firms have a high proportion of imported inputs or of foreign debt.

Theoretically, then, the adaptation of the Minskyan theory to an open economy context depends on the determinants of fragility arising from the firm's financial structure. Essentially, in a closed economy, Minsky presents two criteria to identify the fragility of a speculative unit, namely, its need to roll over finance and its interest rate vulnerability. Moreover, openness can be considered one of those "financial innovations" which Minsky identifies as seeds of the inherently fragile capitalist economies. In an open economy, a unit which has to serve its debt in foreign currency is vulnerable to changes of the exchange rate as well. In this case, a firm is doubly vulnerable; hence it can be called "super-speculative" to use the taxonomy of Arestis and Glickman (2002).

I extend this idea to a CDDC including all the pro-cyclical issues so far presented: because the exchange rate moves with the commodity price, and these exchange rate fluctuations have an impact on firms, in a partially dollarised economy, what can be considered an entirely

equity-financed hedge firm, in reality, can arguably be speculative. The contemporary presence of both commodity dependence and dollarisation points out to the identification of an extra dimension of vulnerability: the inclusion of the commodity market makes the firm triply vulnerable. The term “hyper-speculative” may indicate this.

In the second empirical chapter I will analyse the balance sheet of non-financial firms using this framework in order to identifying possible fragilities in the structure of the Peruvian economy.

3.4 Conclusions

This theoretical chapter stemmed from the idea that the transmission mechanism of monetary and fiscal policies is central to the analysis of the policy challenges that a CDDC faces. This has been conceptualised at the beginning of the chapter and contextualised within the macro management of the commodity business cycle. Given the centrality of the volatility of the commodity prices, a theoretical framework underpinning the macro-management of the commodity business cycle cannot prescind from an analysis of the recent evolution of the commodity future market. Similarly, the importance of dollarisation in a small open economy of Latin America such as Peru cannot be overestimated. These issues will be analysed, empirically, at both macro and micro levels, in the first two empirical chapters.

Finally, this chapter addressed the managed RER as a developmental tool and described in details the channels from the exchange rate to the real economy. It eventually concentrated on the financial channel which will be addressed in the empirical part of the thesis.

Chapter 4 - Methodological Overview

4.1 Introduction

The last two chapters were concerned with a critical review of the literature on monetary policy for CDDCs and with the theoretical framework. This chapter describes methods and data which will be used in the following two empirical chapters.

In terms of method, this thesis is an in-depth study of a single phenomenon (i.e. the developmental implication of commodity price and real exchange rate fluctuations in Peru) with the purpose of elucidating features of a larger class of similar phenomena (i.e. monetary policy effects on the business cycle of CDDCs), but not in the sense that its findings will be extrapolated and uncritically applied to other events. The hope is that, by providing an example, this thesis will shed light on how CDDCs require *ad hoc* policy prescriptions. So far, these have been addressed in an unsatisfactory way by homogenised theories. In this respect, then, Peru provides a critical instance, that is one in which the research will provide a rigorous challenge to existing theories (Gerring, 2004). Hence, this thesis may provide guidance for an alternative framework (sketched in the previous chapter) which can be used in the investigation of similar phenomena.

Apart from this introduction, the chapter has four sections. The second section describes the flow of funds method used in chapter 5 to study the interaction between the real and financial sectors which determined the business cycle of the Peruvian economy and its transformation during the period under consideration. The section illustrates how the flow of funds can be adapted to investigate, more specifically, the flows related to dollarisation. Finally, the limitations of this method are discussed.

The third section describes the mixed-method used in chapter 6 to analyse the balance sheet data of 177 non-financial firms. The mixed-method combines a dynamic panel data econometric analysis and a descriptive analysis based on 117 firms' data.

The fourth section illustrates data sources, data triangulations and data problems.

The fifth section summarise the chapter and introduces the next empirical chapters.

4.2 Flow of funds analysis and its limitations

The interaction between the financial and the real sectors plays a determining role in the structural changes of the Peruvian economy. In particular, the flow of funds analysis allows an assessment of the impact of fiscal and monetary policy on both sectors during the period under consideration in which the economy experienced significant reforms.

The flow of funds is a system of national accounts which depicts the flow of financial instruments within different sectors of the economy. This enables the researcher to determine how sector deficits are financed and how surpluses are used. All data are represented as a percentage of GDP so that it can be easily compared over time and with other countries. The starting point of this analysis is provided by the representation of a series of charts representing the aggregate saving-investment gap. For the case of Peru, I will analyse saving and investment of the domestic economy in relation to the rest of world, assessing how gross fixed capital formation, gross savings and rest of the world savings have changed over time (Dawson, 1996; 2004). Generally transactions are considered from the rest of the world point of view as if it was a closed system: the rest of the world savings is equal to the current account balance with reversed sign. Once the general trends are identified, the economy is then divided in different sectors. The number of sectors is limited by data availability; the minimum number is three, government, private sector and the rest of the world. The objective is to identify net lending and borrowing positions (defined as difference between savings and investments) of each sector and the financial instruments involved in the process (Dawson, 1996).

In the second step, the aggregate analysis of the flow of funds is typically illustrated in matrix form. Columns represent economic sectors, rows indicate from top to bottom income and expenditure flows and balance-sheet flows. The balance is net worth at the end of the period. Both rows and columns sum to zero, thus ensuring that *"everything comes from somewhere and everything goes somewhere"* (Godley and Lavoie, 2007, p.xxxiv). A negative sign indicates a flow of funds from the sector, and a positive sign a flow to the sector. For example, a negative

sign represents a use of flows such as the purchasing of consumption good or financial asset; a positive sign represents a source of funds such as receipt of money from a sale of good or asset.

Thus, applying Dawson's methodology to the Peruvian set of data available, the outcome of the second step will be a financial flow of funds matrix with five sectors, as shown in the following table.

Table 4.1: Financial flow of funds matrix

	Public Sector		**Private Sector**		**Rest of the World**	**Σ**
	Central Bank	Government	Banks	Firms & HH		
Net Lending		Ig-Sg		Ip-Sp	- Current Account	0
Foreign Claims	+R	$-B_{GE}$	$+A_F$	$-B_{FE}$	$-R+B_{GE}+B_{FE}-A_F$	0
Domestic Debt	$+B_G$	$-B_G$	$+B_G$		$+B_G$	0
Private Credit		-PC	-PC	+PC	-PC	0
Govermant Deposit	$-D_G$	$+D_G$	$-D_G$		0	0
Money and Quasi-Money	-M		-M	+M	0	0
Net Worth	$-NW_{CB}$	$-NW_G$	$-NW_B$	$-NW_P$	$-NW_{RoW}$	0
Σ	0	0	0	0	0	0

Source: adaptation on Dawson (1996)

The aim is to show the interlocking nature of financial flows (Godley and Lavoie, 2007). Columns are divided in three main areas. The public sector of the domestic economy is formed by the government and the central bank. The latter is only a small portion of the government sector, but because of its decisive role in money circulation, it is shown separately. The private sector is divided into the production (firms), the household, and the financial (for simplicity, banks) sectors. The column of the rest of world is formed by four components: lending through the acquisition of government bonds which is reflected in two rows (one for the domestic denominated debt, and one for the dollar denominated debt, in the foreign claims row), lending by the acquisition of private claims (FDI and portfolio flows) and the offsetting item foreign claims. The column of the government reveals the various funding instruments (issuance of internal, B_G, and external debt, B_{GE}, and privatisation, PC). The private non-bank sector borrows

via private credit (PC is equity or FDI) or via external debt (foreign claims) and place funds into currency and deposit (i.e. into money and quasi-money with banks, M).

Each row represents the flows in a specific financial instrument. The top row is formed by the net lending positions of the three sectors identified in the first step. The second row, foreign claims, reveals the link between the rest of the world flows, calculated as residuals, and the various sectors of the domestic economy (government external debt, private external debt, banks and the offsetting changes in reserves at the central bank, R). The third row reveals the dynamics associated with internal government debt (B_G) which appears in the central bank (especially from sterilisation practice) or banks balance sheet, while the residual is hold by the rest of the world. The fourth line is dedicated to the private claims. This is provided by the banking sector, by the public sector and by the rest of the world. Private credit originating in the rest of the rest of the world is formed by foreign direct investments and portfolio flows. Portfolio Investments enters the private sector as equity purchased through the stock market. The reminder of this section discusses the limitations of the flow of funds analysis.

Since 1950s, the flow of funds method has become an important tool of social accounting (Dawson, 1996). However, it has only been more systematically applied to developing countries by Post-Keynesian researchers from the 1990s; for example, Dawson (1992) reviews saving and investment in order to verify the effectiveness of monetary and fiscal policy in Indonesia; Holsen (1995) applies the method to identify the impact of a series of reforms in Kazakhstan aimed to rapidly liberalise the economy.

However, this method presents some limitations: first, "accounting identities do not a macro model make" (Easterly, p.12, 2002). Second, especially for developing countries, data may be limited and not reliable. For example, ideally, data should be recorded at market values, but, they are usually derived from changes in balance-sheet values which are evaluated at historical cost (i.e. at the price of acquisition of assets and liabilities). Data are limited because firms and banks are reluctant to reveal the actual state of their business; they hide off-balance sheet activities which, in many cases, are of a very relevant size. Third, smuggling and informal activities escape from the accounting system.

Additional problems appear in partially dollarised economies: dollarisation can only be expressed by adding private credit, money and quasi-money in foreign currency: as highlighted in the literature review (chapter 2), dollarisation is measured only in terms of assets. As a result, these are the only available data. In reality, a better understanding of the effects of monetary policy should consider dollarisation in its multidimensional form and include both assets and liabilities in foreign currency for the various sectors. Additionally, with dollarisation, money contracts in domestic currency may be referring to the exchange rate. Dollars are held to hedge "subsequent liabilities", so dollarisation extends beyond the mere use of dollars. In a dynamic system, it would be crucial to determine which sector of the economy is more dollarised and how various sectors exchange dollar rather than domestic currency. In other word, dollarisation is present in different varieties and degrees, but also may be classified in terms of interlinked assets and liabilities in the different sectors of the economy.

Following Godley and Lavoie (2007), I construct a matrix (table below) which shows financial and real dollarisations through financial and tangible assets as they appear in the balance sheet for each sector of the economy.

Table 4.2: Dollar balance sheet matrix of the dollarised monetary system

	Private sector			**Public Sector**	
	Household	Firms	Banks	Government	Central Bank
Foreign Currency Cash	$+C_H$	$+C_F$			$+R$
Net Foreign Cash Held Abroad (off-shore)	$+O_H$	$+O_F$	$+O_B$		
Foreign Currency Depo	$+D_H$	$+D_F$	$-D_H-D_F+D_{CB}$		$-D_{CB}$
Foreign Currency Bank Loans	$-L_B$	$-L_B$	$+L_B$		
Foreign Currency Firms Bonds	$+B_F$	$-B_F$	$+B_F$		
Foreign Currency Governament Bonds and Loans	$+B_G$		$+B_G$	$-B_G$	$+B_G$
Foreign Currency Assets	$+A_F$	$+A_F$	$+A_F$		
Tangible Capital in Foreign Currency	$+K_H$	$+K_F$	$+K_B$		

C_H and C_F are the foreign cash balances of households and firms; O_H, O_F, O_B are the off-shore balances of the Household, Firms and Banks sectors respectively. D_H, D_F, D_{CB} are the

deposits of Households, Firms and Central Bank. Similarly for each sector, L stands for loans, B for bonds, A for assets and K for tangible assets.

The assets of the public sector are foreign reserves and foreign government bonds; the liabilities are foreign cash deposits held at the central bank. The household sector assets from the top of the table are the dollar cash held domestically and abroad, the dollar deposit (which represents a liability for banks), the dollar bonds issued by domestic firms, the dollar bonds or loans of the government, other foreign assets (foreign bonds and equities) and tangible assets bought in dollars (i.e. real estate and consumer durable goods). The liabilities of the household sector are the bank loans in foreign currency.

The production sector is generally different from the household sector because of its ability to issue equity. However, having focused only on foreign currency stock, this difference disappears since, generally, equity denomination is in local currency. On the contrary, tangible assets are similar to non-dollarised economy as buildings, machines and inventories can be valued in dollars. All sectors can have assets in foreign currencies (i.e. equity, bonds) if the financial account is liberalised.

The matrix would point out two main characteristics of a dollarised economy. Firstly, dollars tend to spill over all sectors and their presence allows for official and non-official flows in and out of the economy (O_H, O_F, O_B). Secondly, traditionally, the lack of reliable data for both assets and liabilities has constrained the measure of dollarisation in empirical studies: the standard asset-side measure of dollarisation is the sum of foreign bank deposits of household and firms (D_H, D_F), and credit to the private sector (L_B) only. On the liabilities side, the external debt has been the only measure for dollarisation.

Thus the matrix showed in Table 4.1 will be modified and adapted to the Peruvian case in the following way: I split private credit, money and quasi-money in local and foreign currencies.

Table 4.3: Financial flow of funds matrix with dollarisation for Peru

	Public Sector		Private Sector		Rest of the World	Σ
	Central Bank	Government	Banks	Firms & HH		
Net Lending		Ig-Sg		Ip-Sp	- Current Account	0
Foreign Claims	+R	-B_{GE}	+A_F	-B_{FE}	-R+B_{GE}+B_{FE}-AF	0
Domestic Debt	+B_G	-B_G	+B_G		+B_G	0
Private Credit		-P_C	-P_C	+P_C	-P_C	0
Peruvian Soles		-PcSoles	-PcSoles	-PcSoles		
Dollars		-PcDollars	-PcDollars	-PcDollars		
Govermant Deposit	-D_G	+D_G	-D_G		0	0
Money and Quasi-Money	-M		-M	+M	0	0
Peruvian Soles	-MSoles		-MSoles	+MSoles		
Dollars	-MDollars		-MDollars	+MDollars		
Net Worth	-NW_{CB}	-NW_G	-NW_B	-NW_P	-NW_{RoW}	0
Σ	0	0	0	0	0	0

Source: adaptation of Dawson (1996) and of Godley and Lavoie (2007)

In conclusion, a flow of funds analysis that includes dollarisation would facilitate an investigation into the potential distributional implications of a particular monetary policy and support its formulation. In the reminder of the thesis, balance sheet of non-financial listed firms will be analysed to extrapolate some information about the flows of dollars.

4.3 The mixed-method

The method of analysis adopted here is based on triangulation which, in social research, implies combining together more than one set of insights in an investigation (Denzin, 1970). In particular, using Denzin's taxonomy, this thesis will be using different forms of triangulation. Methodological triangulations, which involve the combination of different methods, are defined as with-in method and in between method. The first one refers to the use of different varieties of the same method. For example, this thesis applies this method when panel data are analysed with the same econometric technique, but with different specifications. The second one, in-between-method triangulation, involves the combination of different methods. For example, it involves the combination of qualitative and quantitative analyses. In this case, triangulation is between different quantitative methods by using both regression analysis and business cycle analysis (a

mixed of flow of funds and capital structure). This allows completing the investigation carried out through the use of econometric technique which is restrictive for both theoretical and methodological reasons. Additionally, data triangulation is used: this gathering data from different sources (i.e INEI, Conasev, Proinversión) in order to fill the gaps due to partial data sets.

The empirical part corresponding to the balance sheet analysis for non-financial firms presented in chapter 6 will be divided in two parts. Firstly, following Arellano and Bond (1991), balance sheet data is analysed through the dynamic panel data method. This method is characterised by estimating instrumental variables through the Generalised Method of Moments (GMM) technique. The advantages of considering a dynamic panel data are numerous: contrary to a simple cross-section panel method, estimation is no longer biased by any omitted variables. The so-called instrumental variables allow the inclusion of endogenous variables among the exogenous variables such as lagged investment or sales which, in general, otherwise, would be autocorrelated. The idea behind instrumental variables is to find a set of variables, called instruments, which are both correlated with the explanatory variables and uncorrelated with the disturbances. Furthermore, the use of instrumental variables potentially allows consistent estimation when variables on the right-side are measured with error. The panel set data is formed by a high number of firms (117) and a short-time dimension is appropriate for this type of estimation.

The linear dynamic panel data specification is given by:

$$y_{it} = \alpha y_{i(t-1)} + n_i + v_{it} \qquad (1)$$

with $|\alpha|<1$ and i=1,2,...,N and t=2,3,...,T where T is small and N is large. By first-differencing this specification, the individual effect due to each firm is removed because v_{it} is assumed with finite moments and with $E(v_{it})=E(v_{it}v_{is}) = 0$ for s≠t. The first differentiation produces an equation of the form:

$$\Delta y_{it} = \alpha \Delta y_{i(t-1)} + \Delta v_{it} \qquad (2)$$ with $|\alpha| <1$ and i=1,2,...,N and t=3,4,...,T

The last equation may be estimated using GMM techniques. Efficient GMM estimation of this equation will typically employ a different number of instruments for each period, with the period-specific instruments corresponding to the different numbers of lagged dependent and predetermined variables available at any given period. The two-stage instrumental variables GMM technique is the optimal choice for this type of regression.

The GMM estimator $\hat{\alpha}$ is given by

$$\hat{\alpha} = \text{argmin}_{\propto}(\overline{v'}Z)A_N(Z'\overline{v}) \qquad (3)$$

Where Z is a matrix formed of sets of predetermined instruments for individual firms using lags of the dependent variable:

$$Z_i = \begin{vmatrix} y_{i1} & 0 & 0 & \dots & 0 & \dots & 0 \\ 0 & y_{i1} & y_{i2} & \dots & 0 & \dots & 0 \\ \dots & \dots & \dots & \dots & \dots & \dots & \dots \\ 0 & \dots & \dots & \dots & y_{i1} & \dots & y_{i,T-2} \end{vmatrix} \qquad (4)$$

Assuming that v_{it} are not autocorrelated, the optimal GMM weighting matrix for the differenced specification A_N is given by:

$$A_N = \left(\frac{1}{N}\sum_{i=1}^{N} Z'_i H Z_i\right)^{-1} \qquad (5)$$

Where H is a (T-2) square matrix which has twos in the main diagonal, minus one in the first subdiagonals and zeros otherwise.

Given estimates of the residuals from the one-step estimator, one may want to calculate the new weighing matrix, the so called two-step process:

$$A_N = \left(\frac{1}{N}\sum_{i=1}^{N} Z'_i \Delta\epsilon_i \Delta\epsilon_i' Z_i\right)^{-1} \quad (6)$$

The tests associated with this method are: 1) the Sargan Test, called also Hansen J statistic, of over-identifying restrictions which has a null hypothesis of "instruments as a group are exogenous". Thus, the higher is the p-value of the Sargan statistic the better; 2) the autocorrelation tests of the first order, AR(1), and second order , AR(2). Generally, the first order needs to present p-value less than 0.05 while the second order test, which is more important since it tests the null hypothesis of no autocorrelation in levels, has to be bigger than 0.05.

Secondly, an analysis of the business cycle is also carried out in order to complete and enhance the quantitative analysis of the previous part. Initially, because of the exchange rate stabilisation policy, RER fluctuations are analysed in terms of price trend from peaks to troughs in relation to different historical and economic phases. In doing so, I managed to identify four different phases: this will be described in section 6.1. Additionally, non-financial firms' data is used here again for a qualitative analysis. Besides sectors, other categories are tradable/non-tradable and ownership (foreign/domestic/conglomerates). To identify these categories a back and forth analytical method has been developed from the analysis of the previous category. Taking into account the different phases of the RER and the business cycle, this investigation was necessary to complement the econometric analysis which relies on fixed categorisation. Rather, this second enquiry uses *ad hoc* categorisations.

The creation of the various categories followed different stages: as discussed, the first stage considers sectors of activity; in the second stage, data are then grouped in tradable/non tradable. This is so because the focus of the analysis is on the relation between RER fluctuations and the development of different sectors, with RER defined in terms of tradables and non-tradables. However, by analysing the results and the annual reports of the firms it was clear that one firm may operate across different sectors of the economy. For example, if a firm is a conglomerate which operates in different sectors, it will be difficult to categorise it under either tradable or non-tradable. A third stage categorisation considers that, in the specific case of Peru, liberalisation of the capital account and privatisation led to numerous changes of hands throughout the entire period. As a result, there were changes amongst those firms more exposed to exchange rate fluctuations and, consequently, amongst those which mostly benefit from the

interventions of the central bank in the forex market. For these reasons, a categorisation by type of ownership, which may include various firms under the same owner, is needed.

In summary, the first categorisation used is by sector activity. As previously mentioned, I integrate INEI data with the CONASEV sample data. The INEI data are published using the classification described by the table below which has been used in the creation of the CONASEV database (see Appendix B, second column database B).

Table 4.4: Sector and industry classification used by INEI

Sectors	**Sub-sectors**
Agribusiness	Farming and Agricultural
	Agro industry
Commerce	Consumable fuels retailing
	Electricity and water retailing
	Food and drinks retailing
	Consumer durables retailing
Construction	Materials productions
	Real Estate
Electricity and Water	Generation, distribution of electricity and water
Fishing	Fishing Industry
Manufacturing	Food Industry
	Textile Industry
	Furniture Industry (Wood and metals)
	Paper Industry
	Non-metal products Industry
	Basic metal Industry
	Metallic product Industry
	Other products Industry
Mining	Mining sector
	Hydrocarbon sector (production, refinery, commerce)
Services	Transport and communication
	Tourism

The sector analysis is followed by the tradable and non-tradable categorisation in which the tradable sectors are Agribusiness, Commerce, Fishing, Manufacturing and Mining; the non-tradable sector is formed by the remaining sectors.

As discussed, the Peruvian economy is dominated by large conglomerates which invest in different sectors of the economy. For this reason, it can be useful to categorise each firm by ownership rather than by sector because financial decisions are made at a conglomerate level, rather than by discrete production processes. As a result, the degree of exposure to exchange rate fluctuations changes not only in relation to the business cycle for each sector, but also because of changes in ownership.

In order to take into consideration this issue, firms' ownership (shown in the last column of Database B in Appendix B) have been categorised following the criteria below:

- Domestic Conglomerates: firms belonging to a domestic group
- Foreign Ownership: firms with majority stake in equity held by foreigners
- Mixed Ownership: firms with no majority owner but with fragmented ownership in domestic large capital, family or small domestic capital, and foreign capital
- Private and Domestic Ownership: firms owned by private individuals/families or domestic capital not linked to any domestic or foreign group
- Semi-Public: firms which have been partially privatised

From database B, each firm has been allocated using the categories above as shown in the following table:

Table 4.5: Classification of detailed ownership of database B into broader ownership categories

Ownership as in Database B	Final Groups
Banda	Domestic Conglomerate
Bentin	Domestic Conglomerate
Brescia	Domestic Conglomerate
Domestic Conglomerate	Domestic Conglomerate
Ferreyros	Domestic Conglomerate

Ferreyros and Mixed	Domestic Conglomerate
Fishman	Domestic Conglomerate
Foreign Conglomerate	Foreign Ownership
Foreign Firm	Foreign Ownership
Hochschield	Domestic Conglomerate
Lindley	Domestic Conglomerate
Menchelli	Domestic Conglomerate
Menchelli, Wiese and others	Domestic Conglomerate
Mixed Ownership	Mixed Ownership
Private Ownership	Private and Domestic Ownership
Romero	Domestic Conglomerate
Romero –Raffa	Domestic Conglomerate
Semi-Public	Semi- Public
Wiese	Domestic Conglomerate
Raffo	Domestic Conglomerate
Domestic Ownership	Private and Domestic Ownership
Cosapi	Domestic Conglomerate
Raffo and Mixed	Domestic Conglomerate

Therefore, the variables analysed so far are presented again following the categorisation by conglomerate (see Appendix C). Data categorisation takes into consideration the ownership year by year, and consequently a firm is moved from one category to another if its ownership changes overtime. The database formed by this categorisation allows cross-referencing of two categories (i.e. sectors and ownership), so for the following analysis we will take into consideration changes over time that can be reported in the examples below as tables.

Table 4.6: Database summary of categorisation by ownership and by sector for the year 1991 (number of firms)

Count of 1991	Column Labels					
Row Labels	Domestic Conglomerate	Foreign Ownership	Mixed Ownership	Private and Domestic Ownership	Semi - Public	Grand Total
Agribusiness	5	1	7	4		17
Commerce	9	6		2		17
Construction	7		1			8
Electricity		3	1		6	10
Fishing	2	1		1		4
Manufacturing	11	12	5	8	1	37
Mining	6	5	4			15
Services	1	3	1	3	1	9
Grand Total	**41**	**31**	**19**	**18**	**8**	**117**

Source: Appendix C

Table 4.7: Database summary of categorisation by ownership and by sector for the year 2009 (number of firms)

Count of 2009	Column Labels					
Row Labels	Domestic Conglomerate	Foreign Ownership	Mixed Ownership	Private and Domestic Ownership	Semi - Public	Grand Total
Agribusiness	4	5	7	1		17
Commerce	9	6		2		17
Construction	7		1			8
Electricity		7	1		2	10
Fishing	2	1		1		4
Manufacturing	8	16	5	8		37
Mining	5	6	4			15
Services	1	4	1	3		9
Grand Total	**36**	**45**	**19**	**15**	**2**	**117**

Source: Appendix C

4.4 Data

The primary data used in this thesis are gathered from government institutions. Most of the macro data regarding growth and investments are from the BCRP and INEI database. Unfortunately, the central bank holds only foreign direct investments and gross fixed investments at aggregate level. However, during my fieldwork, I managed to obtain foreign direct investment data by sectors from the government's agent Proinversión. This data will be used to perform a triangulation with other sources. Still, this was not satisfactory given that data collected by Proinversión depends on the voluntary declaration of companies.

Therefore, there are several reasons to justify the collection of data at micro level and the creation of a database. For example, balance sheet data can provide additional indications on the level of investments by sectors. Moreover, firms' reports include the net debt US dollar balance, in terms of liabilities minus assets in US dollar, which can provide an indication of firms' sensibility to exchange rate fluctuations.

All micro data have been gathered from Comisión Nacional Supervisora de Empresas y Valores (CONASEV), the stock market regulatory agency of Peru, during fieldwork. Generally, data are available in electronic format since 1999, but archives of the commission had to be

consulted for data of the 1990s. The period of analysis spans from 1991 to the last available year, 2010. The total number of firms available was about 200, but not all the companies lived throughout the period, so firms with less than five years of data have been excluded. Moreover, some firms had to be excluded in order to avoid double counting because they were subsidiaries of firms already accounted for in the sample. Therefore, excluding Banks and other Financial Institutions (see Database B listed in Appendix B for firms' detailed information), the final number of firms used is 117 (these are listed in Appendix C). These firms form the database I created to run the analysis described in the precious section. For each company, and for each year, I have gathered data from yearly audited reports from the following sections: the Balance General (Balance Sheet), the Estado de Ganancias y Perdidas (profit and loss account) and the Notas a los Estados Financieros (Notes to the Financial Statements). All the data collected are in thousands of current Nuevos Soles with the exception of the quantities of assets and liabilities in foreign currency which are in US dollars. The dollar balance gathered are net of derivatives (forwards).

Once collected, data presented a number of problems: first is the absence of consecutive data. Some reports are missing for particular years; therefore the information referring to the year "t-1" has been reconstructed from the year "t" given that the report of each year shows the previous year data. However, the previous year data are expressed in current year terms, so values have to be discounted by the inflation rate which is indicated in the Notes to the Financial Statement. For few points, values have been linearly interpolated given the gap of a single year "t" between two years ("t-1" and "t+1").

Second, some firms do not presents their "Notes to the Financial Statement", which show assets and liabilities in foreign currency.

As a result, the amount of data available varies for each firm. The following table (Table 4.8) shows the number of firm for which data are available for each year. The first column represents the number of firms per year with available balance sheet data; the second column represents the number of firms per year which reported net debt dollar balance (called Risk in US dollar in the Table 4.8):

Table 4.8: Data available by year for the database (number of firms)

	Balance Sheet Data	Risk in USD
1991	60	53
1992	69	63
1993	74	66
1994	83	75
1995	96	86
1996	104	95
1997	107	101
1998	115	113
1999	116	115
2000	116	114
2001	115	113
2002	116	114
2003	111	108
2004	108	106
2005	105	103
2006	102	98
2007	102	98
2008	99	95
2009	97	92
2010	95	90

Source: Appendix C

Values extracted from the Balance Sheets Statements and the Profit and Loss Accounts are:

- Investments: defined as the firm's expenses in land, equipment, machinery, buildings during the year.
- Total Assets
- Total Liabilities
- Current Assets
- Current Liabilities
- Operating Profit
- Net Profit

Variables extracted from the balance sheets of the firms are combined to determine the financial ratios listed in Table 4.9 below.

Table 4.9: Financial ratios used for the database

Leverage	Total Liabilities/ Total Asset
Liquidity	Current ratio = Current Asset/Current Liabilities
Profitability	ROA = Operating Profit/ Total Assets
Solvency	Net Profit/Total Debt

Third, it should be mentioned that the publicly listed companies are the largest firms in the country. This may be a problem in terms of representativeness of the sample in relation to the whole economy. However, since large firms generally tend to have easier access to the US dollar market, either through their volume of exports or in terms of financing through US dollar debt, this selection bias serves the purpose of the investigation. Large firms are exactly the firms which are more affected by fluctuations in the exchange rate.

Fourth, and in relation to the previous point, the INEI sector data are compared with CONASEV database in order to verify the sectoral representativeness of the latter. This is especially important because of the presence, in the Peruvian economy, of large size conglomerates. In order to proceed with the investigation, the micro data had to be representative. Following Carranza et al. (2003), for each sector I compare the share of GDP with the sum of individual firms' assets and sales as proportions of the economy's total assets and GDP. As it will be discussed in chapter 6 the sectoral structure of the economy has not changed throughout the period under consideration. However, the representativeness of CONASEV listed companies at sectoral level changed: the Agribusiness is under-represented; the Utility and the Mining sectors are over-represented. The issue of the CONASEV sectoral representativeness will be taken up in chapter 6. These limitations should be considered when results will be presented.

Table 4.10: Comparison of assets by sectors of CONASEV sample and GDP share by sector (percentage)

CONASEV Sample	Assets by Sectors		Sales by Sectors		INEI Sectors	GDP Share by Sectors	
	1996	2006	1996	2006		1996	2006
Agribusiness	7%	5%	3%	1%	Agribusiness	8%	8%
Commerce	18%	13%	26%	16%	Commerce	15%	15%
Construction	5%	8%	5%	6%	Construction	6%	5%
Electricity	21%	17%	11%	7%	Electricity and Water	2%	2%
Fishing	3%	1%	3%	1%	Fishing	1%	1%
Manufacturing	9%	13%	14%	26%	Manufacturing	15%	15%
Mining	14%	29%	19%	33%	Mining	5%	6%
Services	23%	13%	20%	9%	Transport and Communication, Restaurants and Hotels, Private Health and Education	17%	16%
					Other (Financial Services and Insurance, and Government Services)	33%	32%
TOTAL	100%	100%	100%	100%	TOTAL	100%	100%

Source: CONASEV (data manipulated by author), INEI (2011)

Furthermore, the process of sectoral classification has been problematic in some cases: conglomerates' subsidiaries are often involved in many different sectors, as a result, they could not be easily placed in any sector. For example, Saga Falabella operates in Commerce, Construction and Tourism. The issue has been resolved by identifying the core business of each individual conglomerate in terms of investments and/or sales.

Finally, data are aggregated either in real terms, by using the GDP deflator base year 2005 for Peru and United States, or as a percentage of GDP to facilitate the comparison of the significance of the data from one cycle to another. Data are added for each categorisation (i.e. by sectors), but are also analysed by averaging the number of firms by each category (i.e. average value for the Construction sector) in order to check whether the dynamic panel data have an effect on the overall results (i.e. by averaging the total value for each category by the number of firms per year, it is smoothed the effect of firm joining the sample or dropping off the sample during the sample period). It is clear that these strategies are not rigorous in terms of sample representation but, by confronting different results, the aim is to obtain a general idea about the phenomena under investigation (i.e. what happens to investments if the sample is analysed by different categorisation).

4.5 Conclusions

This chapter presented an overview of the methods employed in the empirical analysis of this thesis.

More specifically, the flow of funds method has been introduced and extended to the case of a partially dollarised economy; then, the method's limitations have been discussed. The flow of funds analysis will be used in chapter 5, where the monetary policy of the Peruvian central bank will be analysed and contextualised in relation to the dramatic process of stabilisation which Peru experienced since the hyperinflation of the late 1980s.

In the third section of this chapter, I presented the mixed-method used in the analysis of the 117 non-financial firms' data which will be used in chapter 6. This consists in combining a dynamic panel data econometric analysis which assesses the relationship between real exchange rate and investments, and a qualitative analysis of the same firms' data which will provide additional information on the behaviour of these firms. The qualitative analysis will be based on an original database.

Chapter 5 - The monetary policy of the Central Bank of Peru since hyperinflation

5.1 Introduction

The election of a new government in 1990 under the presidency of Fujimori signed a significant turning point for the history of Peru. This event coincided with the implementation of central bank independency and the sanctioning of its responsibility in terms of money stability.

The Banco Central de Reserva del Peru (BCRP) formally adopted a monetarist monetary target during the 1990s and then switched to a New Keynesian inflation targeting in 2001. However, instead of maintaining the exchange rate free of floating, the BCRP has continuously intervened in the foreign exchange market throughout the entire period. This practice stands out as an anomaly for the inflation targeting framework. This chapter discusses the Peruvian monetary policy under both the above models. Once the general background of the monetary policy paradigm shift has been sketched out, the chapter introduces two analyses which are alternative to the standard mainstream account: the first is achieved thanks to the flow of funds method, the second is presented through an original representation of liquidity.

The chapter is divided in six sections. Following this introduction, the second and third sections focus on the monetary policy of Peru including the exchange rate policy operational terms: it appears that the BCRP was forced to smooth the volatility of the exchange rate because the economy was partially dollarised. In doing so, it was trying to achieve simultaneously two goals, inflation reduction and exchange rate stability. The sections show, empirically, that for a highly dollarised open economy the only policy option that the central bank can effectively implement to guarantee price stability is to manipulate the exchange rate. Given this fundamental role of the exchange rate volatility, this chapter will contextualise the exchange rate policy through the period 1990-2010: the second section discusses the monetary instability culminated with the hyperinflation and collapse of the economy at the end of the 1980s. This sets the conditions for the following monetarist policy frameworks. From this, it will then address the adoption of the new consensus framework, inflation targeting, which was adopted in 2001 and still maintained until today. This is addressed in the third section.

The fourth section assesses the monetary policy effectiveness, within the broader dynamics of the business cycle, from the end of the 1980s to 2010. The flow of funds analysis provides an alternative lens under which hyperinflation, stabilisation, and the policy of the central bank can be explained. The whole period will be divided in three: the hyperinflation of the 1980s, the period from 1991 to 2002 characterised by stabilisation ending in stagnation, and the following commodity boom period until 2010. This analysis will tease out the credit dynamics, money and liquidity in both domestic and foreign currencies; this will lead to an alternative interpretation of the monetary policy based on the idea of internal and external liquidities developed in the theoretical chapter. This new interpretation will shed light on the policy of the central bank and confirms the findings of the flow of funds analysis and will be illustrated in the fifth section. The sixth section draws some conclusions.

5.2 The disease and the cure, from hyperinflation to the Washington Consensus

The aim of this section is to analyse the background of the Peruvian economy just before the important turning point of the Fujimori government in 1990. The stabilisation process, which Peru experienced in the 1990s, assumes great importance considering that, at the end of the 1980s, Peru was in a macroeconomic chaos: inflation reached about 7,500 percent, fiscal deficit was of about 7,8 percent of GDP, total external debt was around 80 percent of GNP, with a heavily dollarised economy, and all with an underlying negative real growth rate of 11.6 percent (WDI, 2011). In addressing the long stabilisation process started in 1990, this section will focus mainly on two aspects, namely dollarisation and hyperinflation, and it is divided into two periods, the years when hyperinflation hit and dollarisation increased, and the years after the "shock therapy" in 1990.

5.2.1 The road to dollarisation and hyperinflation

The collapse of the economy came about during the so-called heterodox government of García (1985-1990), but it is generally recognised that this was the culmination of a longer

process (Jimenez, 2010; Parodi Trece, 2000). The length of this process is accompanied by the progressive dollarisation of the economy. This started to increase significantly in Peru throughout the 1970s when, under the military government of Morales Bermudez (1975-80), inflation went from about 20 to 70 percent. Most importantly, petrodollars started to enter in Latin America: this contributed to double the external debt from about 16 percent of GDP in 1973 to 42 percent of GDP in 1979 in Peru. With the first democratically elected orthodox government of Belaunde (1980-85),[32] this trend continued until the 1980s debt crisis. At the beginning of this government, the current account was balanced and there was no fiscal deficit. However, the sudden trade account liberalisation induced an enormous increase of imports, especially consumer goods which caused the external balance to move into deficit.[33] Public investment and consumption were dependent on external debt, while a series of mini-devaluation were supposed to slow demand (imports) with the effect of controlling inflation and re-aligning the real exchange rate. In reality, since the economy was heavily dollarised, the effect of this policy was muted and inflation continued to rise. Simultaneously, the increase of international dollar interest rates had a devastating impact on public finance for all Latin American countries, and Peru was no exception. The country experienced no growth in 1982 and a negative real grow rate of 12.6 percent in 1983.[34] By 1983, more than half of bank deposits were in dollars (Table 5.1). Thorp (1987) defines the process of dollarisation in Peru in those days as a "proper defence mechanism" (p.64).

[32] This is the second government of Belaunde: he was in power during 1963-68 when he tried to implement the ISI model. Despite the ideological differences, both his governments kept an expansionary fiscal policy funded via external debt.
[33] See Memoria BCRP 1988 for data.
[34] In 1983, the economy was also badly affected by *el niño* which caused an estimated loss of (current) 1,500 millions of US dollars.

Table 5.1: Dollarisation, inflation and changes in exchange rate (percentage) (1981-1991)

	Dollarisation Ration of Broad Money		Inflation	Change in Currency (-depr.)
	In Peru	Including Deposit Abroad *		
1981	27	37	75.4	-32.6
1982	35	49	64.4	-48.8
1983	40	57	111.2	-56.4
1984	49	65	110.2	-60.1
1985	30	55	163.4	-59.2
1986	11	36	77.9	0.0
1987	10	39	85.8	-57.7
1988	32	70	667.0	-93.4
1989	21	54	3398.7	-90.5
1990	47	76	7481.7	-99.0
1991	58	73	409.5	-46.2

Source: IMF (2011), *De la Rocha (1998)

As a response to the failure of the orthodox administration, an heterodox government led by García was elected in 1985, under the idea that a radical change was needed, according to which, and contrary to the orthodox approach, prices had to be managed in order to control inflation; monetary and fiscal expansionary policies were needed to resume growth. Monetary policy aimed, through low interest rates, to compensate the loss of mark-up paid by firms, which had to accept price rigidities. Fiscal policy had to stimulate domestic demand which, in turn, would favour the expansion of production eliminating bottlenecks and, consequently, bring deflation. The fiscal deficit was viewed as a consequence of inflation, not as its cause, as the monetarists argued (Parodi Trece, 2000). Most importantly, García tried to establish a mutual beneficial agreement between the government and the biggest 12 economic groups, the so-called 12 apostles.[35] These conglomerates were supposed to commit to increasing their investment in exchange for a series of government subsidies. This was given by a system of multiple exchange rates and tariffs. Peruvian conglomerates were extremely powerful, inserted in all sectors of the economy, and in charge of a number of banks.

[35] These were: Romero, Raffo, Brescia, Nicolini, Wiese, Bunge & Born, Picasso, Rothshield, Aries, Betin, Ferreyros, Lanatta Piaggio.

The short-term results of these policies were positive: inflation started to decline, deposits in foreign currency were confiscated and the economy de-dollarised thanks to the prohibition of holding foreign currency.[36] Nevertheless, soon, external and fiscal balance started to deteriorate while private investment was not picking up as desired since conglomerates' banks were not providing credit to smaller companies. In 1987, García decided to take control of credit by proposing the nationalisation of the banking system (Vasquez Huaman, 2000).

The consequences were dramatic o In order to avoid dollar flight and to encourage dollar repatriation, at the end of the decade, foreign deposits in the country were allowed again, but it was too late: firms and citizens could acquire dollar deposits outside the country, the ratio of broad money to GDP decreased during the period, and after 1988 foreign deposit increased (Table 5.1) (Quispe, 2000). The parallel exchange rate increasingly diverged from the official nominal exchange rate as uncertainty on the domestic currency increased (Table 5.2).

Table 5.2: Nominal exchange rates (official, CBME[37] and un-official or parallel) (1982-1991)

End of the period Exchange rate vs. $ dollar						
Currency denomination	Year	Official	CBME	Parallel	Difference in %	
					Official - Parallel	CBME - Parallel
Soles/$	1982	0.99	0.99	1.00	1.0%	1.0%
	1983	2.27	2.31	2.35	3.5%	1.7%
	1984	5.70	5.82	5.82	2.1%	0.0%
Intis/$	1985	13.95	17.38	17.38	24.6%	0.0%
	1986	13.95	17.45	20.03	43.6%	14.8%
	1987	33.00	62.82	92.00	178.8%	46.5%
	1988	500.00	1,749.50	1,700.00	240.0%	-2.8%
	1989	5,261.40	12,643.24	12,940.00	145.9%	2.3%
	1990	516,923.00	516,922.57	547,500.00	5.9%	5.9%
New Soles/$	1991	0.96	0.96	0.97	1.0%	1.0%

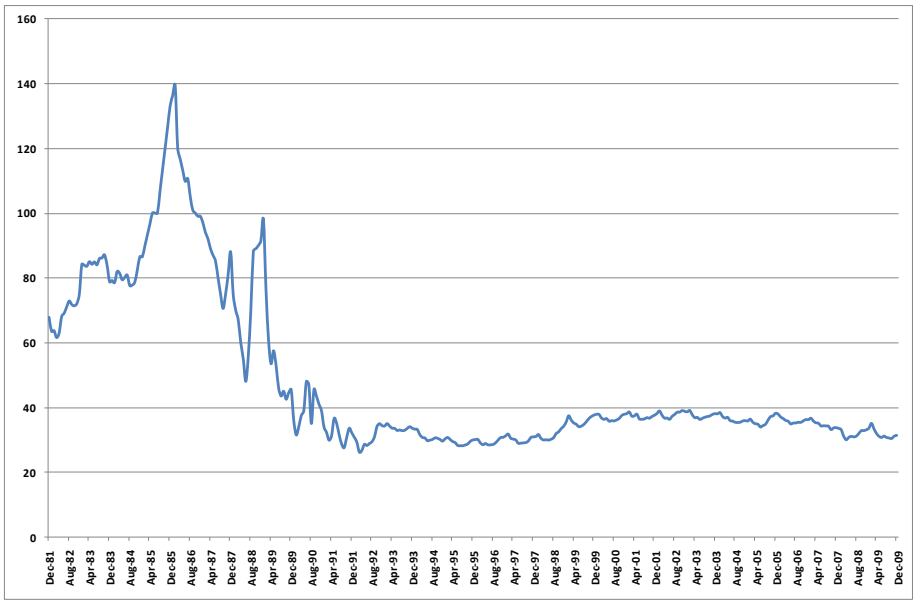
Source: BCRP (2011), IMF (2011)

[36] In reality, the drop of dollarisation in the official statistics might also be due to flight of dollars held abroad and not registered.

[37] CBME stands for Certificados Bancarios de Moneda Extranjera. This is the exchange rate used by the banking system on small deposits.

In 1985, the currency was re-valued by 1,000 and the Peruvian inti replaced the sole. A new revaluation by 1,000,000 was introduced in 1991 and the inti was replaced with the new sole (Table 5.2). However, repeated devaluations had to be contained as fighting inflation was given top priority. Consequently, the real exchange rate appreciated substantially at the end of the 1980s and beginning of the 1990s, remaining substantially unchanged until today (Figure 5.1).

Figure 5.1: Bilateral RER (Index July 1985=100) (1981-2009)



Source: author's calculation from BCRP (2011)

5.2.2 The election of Fujimori and the war to inflation

The previous sub-section highlighted two particular issues emerged in the 1980s: the increasing dollarisation of the economy and the appreciation of the real exchange rate culminated with the hyperinflation at the end of the decade. This sub-section focuses on the monetary policy adopted during the so-called disinflation period (1991-2001) in which the BCRP followed a monetary target model (De la Rocha, 1998).

The 1990 elections were characterised by the rejection of the old parties that had dominated the political scene of the 1980s which led to three years of hyperinflation, deep recessions and violent social upraises.[38] A last minute turn-away from the right-wing independent candidate, the Nobel Prize writer Mario Vargas Llosa, who represented the orthodox "shock therapy", favoured a moderate agronomist, Alberto Fujimori.

Following a neo-populist campaign, Fujimori was elected with no parliamentary majority. A double agreement was needed: on the one hand, an alliance with the army to avoid a coup d'état and fight the revolutionary movement *Sendero Luminoso*. On the other hand, relations with major financial actors were established. Once in power, Fujimori abandoned his promises and, with a government formed by technocrats close to the financial elite, implemented a drastic austerity orthodox program (Parodi Trece, 2000).

A programme to fight inflation was announced in August 1990: all exchange rate controls were eliminated, a single exchange rate was restored, current and capital accounts were opened up, and price controls were lifted. Furthermore, interest rates were freed and banks' reserve requirements were gradually lowered. Peru adopted the principles of universal banking by privatising public banks and implementing Basel standards. The stock market was privatised and mutual funds started to operate when the reformed pension system offered the possibly to opt for a private pension (De la Rocha, 1998). To tackle the fiscal deficit, it was argued, subsidies were eliminated. This implied a corrective inflation of 397 percent in the month of August 1990 alone, which clearly hit mostly the poorest part of the population who was the electoral basis for Fujimori. As mentioned, a fiscal reform was implemented in order to reduce public expenditure, so that the repayment of interests on the external debt, denied during the García administration, could be resumed.[39]

In monetary terms, policy was implemented via market-based instruments with open-market operations. Direct credit from the central bank was discontinued in 1991 and discount

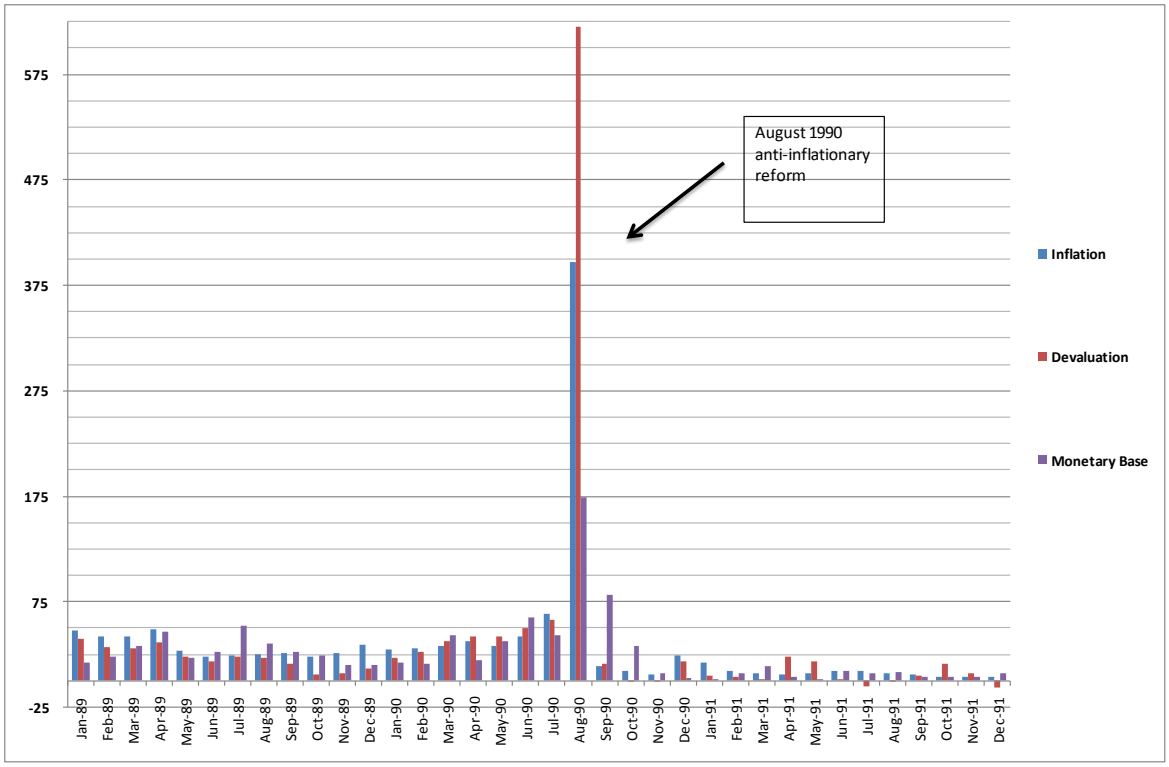
[38] Between 1985 and 1990, almost 10,000 people were killed in political conflicts, 3,496 strikes led to an estimated loss of about 91,277 hours per worker (Apoyo, 1990).

[39] The plan to re-integrate Peru in the international financial market was agreed after the first repayment in October 1990. This forced another price adjustment in the following December/January. The entire reform followed IMF advices, but was not under the IMF surveillance. For this reason, it was called shadow programme (Parodi Trece, 2000).

window borrowing was rapidly reduced. Reserve requirements for domestic currency liabilities decreased from 45 percent in 1990 to nine percent in 1993. The priority was to re-gain control of money issuance, which implied changes on two fronts. First, internally, the government could not be funded by the central bank. Second, externally, the system of multiple exchange rates had to be abandoned providing, under a free floating system, a single market where agents could exchange currencies. In this way, it was possible to implement a restrictive monetary policy which would cause deflation, according to the monetarist model: the central bank could only issue the monetary base by buying dollars and selling soles. The control of the monetary base implied a reduction amount of soles sold by the central bank and a consequent trade-off between a reduction of inflation and a currency appreciation. This could be observed in the first months after the reform (Figure.7.2).

To summarise, the change of the monetary stance had no impact on the exchange rate policy, the real exchange rate continued to appreciate maintaining the policy of the late 1980s when the exchange rate was considered a nominal anchor for inflation.

Figure 5.2: Monthly changes in inflation, devaluation and monetary base (1989-1991)



Source: author's calculation from BCRP (2011) and IMF (2011)

A proof that an exchange rate appreciation was favoured during these years is provided by the fact that, initially, there was supposed to be a devaluation of 450,000 intis/dollar in correspondence to the general increase of prices. However, this only translated in practice in an increase of 300,000 intis/dollar (Parrodi Trece, 2000). It took the whole 1991 to reduce inflation to about 400 percent, since further increases/adjustments in controlled prices continued during the year to cover fiscal expenses.[40]

Simultaneously, the liberalisation of the financial account created an influx of capital into the economy and pushed the exchange rate downwards. This allowed the central bank to increase

[40] For example, petrol price increased by 5.5% in April, 3.4% in May and 24.2% in June. Drinkable water and electricity increased respectively by 83.8% and 20% in June. Electricity increased again by 27% in July (Parodi Trece, 2000).

its dollar reserves via small interventions. In the next chapter, the effects of the exchange rate policy will be discussed in more details.

The reform continued under a state of emergency. The congress granted Fujjimori 150 days in 1991 in which he could legislate by emergency, avoiding parliamentary discussions. Nevertheless, in April 1992, the President decided to get full power with an *autogolpe*. Despite his popular consent, the international community forced Fujimori to run elections in November 1992 when he received a majority of 74 percent (Parodi Trece 2000). Ironically, 74 percent was the inflation rate at the end of 1992, a year in which the economy was affected by capital flight, a credit crunch, and hit by *el niño*.

In summary, this second section has provided a historical background of the Peruvian economy since the 1980s. While the economic scene was dominated by hyperinflation (during the 1980s) and stabilisation (during the 1990s), the political scene is characterised by problematic government-business relations. These were analysed within the developmental state tradition by Schneider (2004). While a review of the literature on developmental state (Chang, 2002; Johnson, 1982; Woo-Cumings, 1999; Amsden, 1989; Wade, 1990) is beyond the scope of this thesis, it provides a powerful framework for the analysis of government-business relations. According to this tradition, state autonomy, defined in terms of state independence from particular interests, is an essential pre-condition for successful developmental state interventions. Schneider (2004) emphasises the lack of autonomy of the Peruvian governments from specific interests also with respect to various degrees of authoritarianism. [41]

The next sub-section will address the new role assigned to the central bank and the monetary policy adopted during the Fujimori government.

5.3 The monetary policy since the independence of the central bank

After the emergency period and the electoral victory of Fujimori in 1992, the monetary policy remained the same, as recommended by the International Financial Institutions. However,

[41] The developmental state literature has been criticised by Fine (2006).

in 1993, the central bank became formally independent within a new *de jure* framework that sanctioned price stability as its only objective (De la Rocha, 1998).[42]

After this, two periods can be distinguished, one until 2001 when the monetary target was adopted, and a second one from 2001 until 2010 during which the central bank implemented inflation targeting. The next two sub-sections addresses these two periods respectively.

5.3.1 The monetary target years (1993-2001)

During the first period, between 1993 and 1997, liberalisation led to capital inflows which financed the negative trade and current accounts. The latter was heavily affected by the interest payments on the external debt. This was the period of privatisation and increase of foreign private investments and was followed by a more difficult period, between 1997 and 2001, in which the Russian and Asian crises caused a withdrawal of foreign capital inflows, and the phenomenon *el niño* had an effect on many sectors of the economy.

During these years, the CBRP adopted a monetary target approach: the level of liquidity and money growth had to be compatible with the inflation objective, given the macro-economic scenario. Within the model, the supply-side was derived by forecasting sectors' growth rates; the demand-side was calculated by anticipating consumption and investment growth levels for both private and public sectors. Therefore, it was established an annual target for inflation, not to be disclosed to the public, so that anticipation and sudden changes in the demand for money could be avoided. Consequently, a consistent intermediate target was identified, money base growth, through money demand forecasts (De la Rocha, 1998). Since 1992, it was established that the central bank and the ministry of finance had to announce *La Cartas de Intension* (letter of intent) the financial and monetary policies aimed to reduce inflation. From 1994, the annual inflation target was going to be announced to the public (Table 5.3).

[42] The "Ley Organica" (Organic Law) was adopted by the central bank in 1992, but the Peruvian constitution changed in 1993 establishing the fight to inflation as its unique objective. The constitution defined the case for impeachment for the Board of Directors following the Organic Law under the following: 1) financing the public sector (except indirectly through the secondary market with a ceiling of 5% of precious year monetary base 2) financing any state developing bank 3) granting guarantees 4) granting credit to any particular sector of the economy 5) establishing multiple exchange rate system (De la Rocha, 1998).

Table 5.3: Published inflation targets and respective realised inflation (percentage) (1992-2001)

	Declared Inflation Target	Consumer Price Inflation	Wholesale Price Inflation	Published Document
1992		73.5	57.2	
1993		48.6	47.6	
1994	15.0 - 20.0	23.7	17.9	Carta de Intencion (May 1994)
1995	9.0 - 11.0	11.1	10.5	Carta de Intencion (July 1995)
1996	9.5 - 11.5	11.5	9.4	Carta de Intencion (May 1996)
1997	8.0 - 10.0	8.6	7.4	Carta de Intencion (May 1997)
1998	7.5 - 9.0	7.2	7.3	Carta de Intencion (April 1998)
1999	5.0 - 6.0	3.5	4.9	Carta de Intencion (May 1999)
2000	3.5 - 4.0	3.8	4.3	Programa Monetario (Jan 2000)
2001	2.5 - 3.5	2.0	1.4	Programa Monetario (Jan 2001)

Source: IMF (2011) and Rossini (2001)

Unlike many other Latin American countries, Peru ruled out the peg of the exchange rate as a consequence of both capital mobility and lack of international reserves.[43] The choice of the monetary intermediate target was preferred to the alternative interest rate target which was considered difficult to implement because of rapid deflation and shallow financial markets (De la Rocha, 1998).

Therefore, the intermediate target chosen during this period was the base money growth. In order to establish the target, the rate of growth of the money aggregates was calculated following the Fisher equation (see literature review):

$$\Delta M = \Delta P + \Delta Y - \Delta V \qquad (1)$$

Where M = liquidity, P = Target inflation, Y= sustainable output growth, V = estimated velocity of money. Thus, it is possible to derive the intermediate target given the multiplier:

$$M_0 = M/m \qquad (2)$$

[43] In reality, during the second half of the1990s, both Argentina and Brazil managed to keep a pegged exchange rate by accumulating international reserves through an increase of public external debt (Schorr, 2003). The Peruvian government, however, ruled out an increase in public debt.

Where M_0 = base money, m = multiplier given by the estimated preference ratio for currency and bank reserve coefficient (see literature review).

As discussed in the literature review, monetary targeting presents many problems since the above relations are unstable. Observing the Peruvian data (Table 5.4), it is evident that, even after 1993, when inflation was under control and the new monetary framework at regime, monetary policy based on monetary targets was difficult to manage. If we populate the above model with actual data, the resulting GDP growth rate would be substantially different from the actual GDP figures, particularly from 1992, 1994 and 1995 (see error row, Table 5.4).

More specifically, the instability of money velocity disallowed the applicability of the first equation. Velocity suddenly dropped in 1994, given an increase of the money aggregate relative to nominal growth, and in 1995, because nominal growth decreased more than the monetary aggregate. For the same reasons, the money multiplier appeared particularly unstable in 1994.

These behaviours are explainable by two conflicting forces: on the one hand, the central bank wanted to decrease the growth of the monetary base in order to control inflation; on the other hand, financial deepening re-enforced the endogeneity of money since the liberalisation of the capital account allowed commercial banks to access foreign credit. This can be shown by the change in monetary aggregates in the year 1994 (Table 5.4).

Table 5.4: Monetary variables for the central bank model and GDP real growth (1992-2001)

		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	dM - Monetary Aggregate (M2)	95.1	51.5	73.0	47.0	24.2	19.2	15.4	1.7	6.0	6.9
	dP - Inflation	73.5	48.6	23.7	11.1	11.5	8.6	7.2	3.5	3.8	2.0
	V - Velocity	-13.7	1.7	-17.7	-16.5	-8.7	-3.6	-8.5	3.1	0.7	-4.9
(1)	Real Growth = dM -dP+dV	7.9	4.6	31.5	19.3	3.9	7.1	-0.4	1.4	2.9	0.0
(2)	Nominal GDP	68.5	54.1	42.3	22.7	13.4	14.9	5.6	4.9	6.7	1.7
	Real GDP = Nominal GDP - Inflation	-5.1	5.5	18.6	11.5	1.8	6.4	-1.7	1.4	3.0	-0.3
(1)-(2)	Error	**13.0**	**-0.9**	**12.9**	**7.8**	**2.1**	**0.7**	**1.3**	**-0.1**	**0.0**	**0.3**
	dH - Monetary Base	68.9	50.0	39.8	40.7	15.3	13.7	12.5	6.7	6.0	3.2
	m - multiplier	15.6	1.1	23.7	4.4	7.8	4.9	2.6	-4.7	0.0	3.6

Source: BCRP (2011) and IMF (2011)

In addition, the post-liberalisation deepening of the financial sector caused sudden changes in the multiplier (Table 5.5) leading to an initial decrease of the preference currency over deposit ratio (see chapter 2). As a result, the multiplier was pushed upwards and its volatility increased because of the unstable nature of the effective reserve requirements. Theses suddenly increased during the years of the Russian and Brazilian crises in 1998-1999.

Table 5.5: Money multiplier and its variables (1992-2001)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Multiplier m (M1/M0)	2.11	2.41	2.09	2.05	2.25	3.19	4.27	3.79	3.73	3.52
Preference ratio for Currency c	44.7	43.0	37.5	36.1	31.6	29.6	31.3	32.9	31.5	30.2
Effective Reserve Requirment	16.0	8.0	6.1	10.6	9.3	8.5	10.6	10.5	8.8	8.0

Source: BCRP (2011)

Once defined the model used by the central bank, a way to fully understand the *de facto* policy of the BCRP during the 1990s is to observe its operational instruments. These were:

1) intervention in the money market through CDs (since 1994);

2) intervention in the foreign exchange market which are sterilised through issuance of CDs;

3) rediscounts, a provision loan, for temporary liquidity shortage;

4) reserve requirements on foreign currency deposits and interest paid were used to control expansion of monetary aggregates in foreign currency;

5) the repo market was created in order to inject liquidity in the monetary system (since 1997);

6) swaps: the central bank could buy foreign exchange from the financial sector and could sell it the day after (since 1997).

With the 1993 change in the monetary framework, the BCRP started to use instruments which were market-based. Since 1994, the central bank operated through CDs (CDBCRP, Table 5.6) for two purposes: to allow contractionary operations and to sterilise foreign exchange interventions. However, in general, foreign exchange interventions are sterilised through issuance of CDs to avoid an increase of base money when the central bank buys foreign currency. In this case, the increase in assets of the central bank is balanced through the sale of dollars to the private or to the public sectors. The latter can absorb the foreign currency either into the treasury, if it needs to cover external payments, or into the deposits at the central bank.

Table 5.6: Flows of CDs to the private sector (Millions of nuevos soles) (constant prices base year 2005) (1992-2001)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Flows of CDs in the private sector	0.00	11.68	337.71	90.61	-389.15	573.15	-351.00	67.40	995.70	506.10

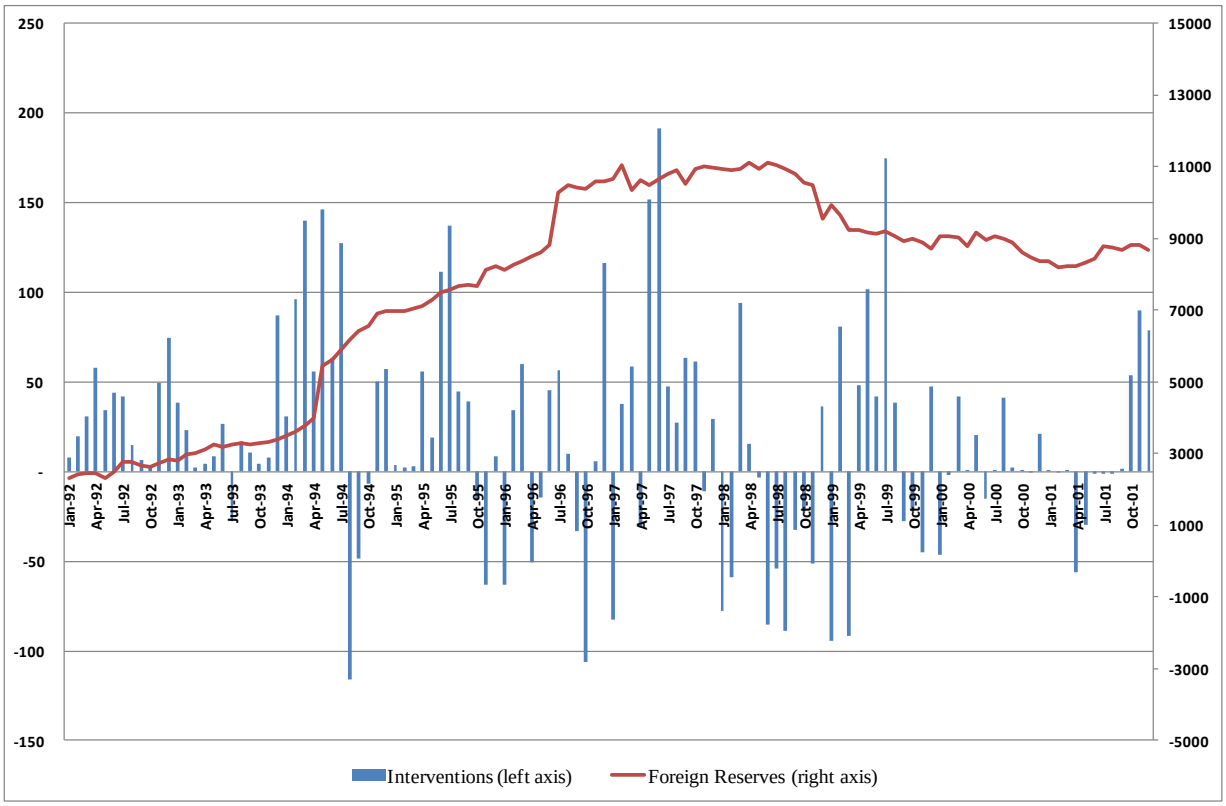
Source: BCRP (2011)

The extensive use of both the above instruments in Peru confirms that, under a money target framework in a highly dollarised economy, the central bank is forced to maintain the exchange rate stable to guarantee monetary liquidity in the financial system as it was discussed in the chapter 2.[44]

After the first months following the adjustment shock, the Peruvian central bank always intervened in the foreign exchange market until the end of the monetary target regime in 2001. The absence of liquid private and public assets in domestic currency forced the BCRP to use intervention as means to control base money growth (Rossini and Vega, 2007). Throughout this period, the central bank intervened on a daily basis and in both directions so that the exchange rate regime could be safely classified as a *de facto* dirty floating (Figure 5.3). The result of stabilising inflation and the intervention in the foreign exchange market worked in favour of a stable real exchange rate in the 1990s.

[44] Since then, this is also explicitly mentioned by the Money and Foreign Exchange Committee in charge of running daily operations at the central bank. The Committee decides on: 1) the amount of dollars to trade in the foreign exchange market 2) whether to auction CDs and what amount 3) the discount rate (Rossini, 2001).

Figure 5.3: Central Bank interventions in the foreign market and reserve accumulation (Millions of US$) (1992-2001)



Source: BCRP (2011)

However, these interventions were small between 1992 and 1994, but became larger in subsequent years in order to avoid a significant appreciation of the exchange rate caused by large capital inflows (see next section for an analysis). This allowed a rapid increase of foreign reserves, which had reached low levels during the hyperinflation crisis until the Brazilian and Russian crises in 1998-1999.

A further monetary policy instrument is the ratio of reserve requirements in foreign currency: this deals with the dollarised part of the economy by trying to control the supply of dollars. Generally, reserve requirements help the central bank to sterilise large capital inflows and to control the availability of lending funds in the financial system. These requirements are used to prevent the expansion of monetary aggregates in foreign currency. They also form a

cushion of safety of liquid assets which may be necessary in case of sudden capital outflow. In 1993, in Peru, the marginal reserve requirement for foreign currency deposits was 45 percent. In 1998, with the Russian crisis, this was initially lowered to 35 percent and subsequently fixed at 20 percent in order to increase liquidity in foreign currency. In 2004, when there was plenty of liquidity thanks to the commodity boom and financial inflows, the requirement was increased back to 30 percent.

To conclude this discussion, it is worth nothing that there is a vast empirical literature on Peru that addresses the entire *modus operandi* of the BCRP (De la Rocha, 1998; Quispe, 2000, 2001). In general, this identifies three main channels of momentary policy transmission, namely, money, credit and the exchange rate. First, the money channel attributes the main role to the money base which allows changes in CDs rate and consequential changes in discount rate, growth of liquidity in domestic money and foreign money. This channel seems to be effective under the condition of dollarisation seen as asset substitution and not as currency substitution (Quispe, 2000). According to De la Rocha (1998), dollars are used as a store of value rather than for transaction purposes, a conclusion reached by analysing the compositions of current account, saving deposits and time deposits in both soles and dollars, and the withdrawal frequency which is defined as the average withdrawal to average balance outstanding. Consequently, a weak transaction dollarisation minimises the disturbances caused by dollarisation, thus the monetary policy through the money channel can be effective. Quispe's (2000) findings are that narrow money, base money and money in circulation, are the best predictors for inflation under the hypothesis of asset substitution. Base money is mainly composed by household cash holdings.

Second, the credit channel is considered to be weak: high capital mobility and degree of substitution between equity and bond, as sources of funding, reduce monetary policy effectiveness. However, higher levels of financial intermediation improve it. In theory, there is the possibility of a strong credit channel since most of the Peruvian companies are of small and medium size and they do not participate in the capital markets. However, it is hard to identify the interactions and dynamics of domestic and foreign credit simultaneously. Moreover, there is no control on external funding. The only marginal influence could come from changes in reserve requirements.

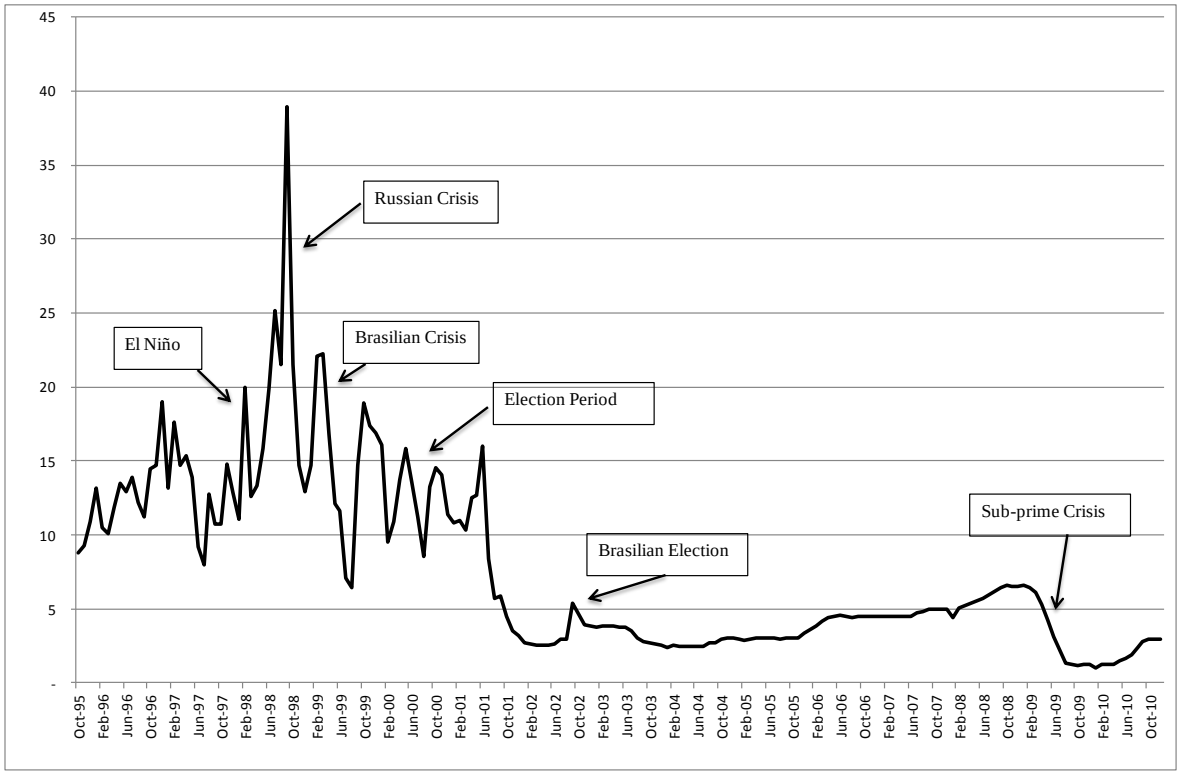
Finally, the exchange rate channel is considered to be strong given the higher dollarisation of the economy. However, since foreign and domestic assets are assumed to be substitutable, there are strong doubts that the central bank has the full ability to control inflation through foreign currency interventions. As a result, these interventions tend only to smooth the exchange rate volatility and are considered to be only a support to the monetary target (Quispe, 2001).

5.3.2 The migration to and establishment of inflation targeting (2001-2010)

The end of the 1990s was difficult for many emerging countries because of the international context. However, Peru had to survive a political crisis too. The year 2000 was time for election, and Fujimori won for the third time, despite the constitutional two-presidency limit. Accused of corruption and electoral fraud, Fujimori flew to Japan and sent his resignation via fax from a Hotel in Tokyo; he is currently in prison in Peru. President Toledo won the next elections and remained in charge until 2005, and then García took power until 2011.

In 2000, the BCRP gradually shifted monetary policy starting to target banking reserves at the central bank; in 2001, for the first time, the economy experienced deflation and the BCRP officially acknowledged that the monetary base was difficult to predict and showed low correlation with inflation. Eventually, in 2002, the BCRP officially adopted the standard IT framework: the interest rate had to be stabilised at first; so, for the first two years, the central bank used a corridor for the interbank interest rate and, after 2003, the centre of the corridor became the proper target (Armas and Grippa, 2005; Rossini and Vega, 2007).

Figure 5.4: Interbank interest rate as annual percentage (1994-2010)



Source: BCRP (2011)

As discussed in chapter 2, inflation targeting was conceived for developed countries with a sound financial system and no dollarisation. The BCRP had no choice but to adopt an adaptation of the IT model considering the possible effects of dollarisation on aggregate demand (Rossini and Vega, 2007; Moron and Winkelried, 2005; Vega et al. 2009). In terms of transmission mechanism of the monetary policy, because of dollarisation, additional attention had to be paid to the balance sheet channel, especially after the credit crunch of the late 1990s. Generally, a real devaluation can induce contractionary effects: the Peruvian devaluation of about 25 percent of the nominal exchange rate between 1998 and 1999 created a problem for those (many) firms which had their debts in dollars. This balance sheet channel has been investigated by a number of empirical studies (Carranza et al, 2003; Jimenez, 2003; Saldaña and Velasquez, 2007). They all agree that a real devaluation has a negative impact on investments for non-financial firms.

I briefly discuss this channel here because it is included in the central bank model described below. However, I will further analyse the effects of the real exchange rate fluctuation in the next chapter.

As discussed, the only difference between the general IT model and its adaptation to a dollarised economy is in the IS equation below.

$$\tilde{y} = -a_r r^{gap} - a_r r^{S,gap} - a_b RER(US)^{gap} + a_m RER(M)^{gap} + u \qquad (3)$$

The first term represents the inverse relation between real interest rate gap and output gap as in the standard version discussed in chapter 2. The nature of this relation should be endogenous to the domestic economy. In the Peruvian model, the long-term real interest rate is obtained by discounting the nominal interest rate by the expected core inflation. In turn, the nominal long-term interest rate is calculated by adding a liquidity premium to the financial market short-term interest rate. Furthermore, the expected core inflation is derived by a combination of rational and adaptive expectations. Thus, the real interest rate gap is given by the difference between the real interest rate just described and the long-run equilibrium interest rate.

Most interestingly, under the assumption of uncovered interest parity, the long-run equilibrium interest rate depends on the external USA interest rate, on the bilateral real exchange rate and an interest rate risk premium.[45] This implies that dollarisation, which may vary with dollar interest rate and the real exchange rate, sneaks into this first term which should deal only with the domestic economy. This highlights the problem of creating a model which should be both consistent with the standard formulation of IT and should incorporate dollarisation. The contradictory nature of the problem is recognised by the central bank:

"...the interventions of the Central Bank have the purpose to smooth the path of the exchange rate. When we tried to incorporate dollarisation in the IT framework in order to include the effects of the exchange rate policy, we were criticised by established researchers like

[45] The bilateral real interest rate is calculated using the nominal exchange rate versus the US dollar and the inflation rate in the USA, the multilateral real interest rate is a weighted average of the bilateral real exchange rates of the main trading partners of the country.

Svensson..." (Marco Vega, Deputy Manager, Economic Research at BCRP interviewed at the BCRP, translated by the author)

It is interesting to note that the BCRP does not follow the standard formulation of the uncovered interest rate parity, according to which interest rate movements cause exchange rate adjustments. In fact, while, generally, rational expectations would generate jumps in the nominal spot exchange rate, which are acceptable in a free floating regime, the BCRP uses adaptive expectations to simulate the smoothing effect of its interventions.

The second term of the equation represents the exogenous effect of the foreign real interest rate. This is calculated by deflating the USA nominal interest rate by the expected inflation (following the same definition used for the domestic real interest rate in the previous term) and by adding the expected devaluation of the exchange rate versus the dollar (following the currency substitution model discussed in the literature review): an expected devaluation is equivalent to an increase of foreign interest rate which decreases aggregate domestic demand. By including this term, the BCRP takes into account the effect of a contractive depreciation. This concerns especially the non-tradable sector which may hold dollar loans and receive income in soles. Interestingly, according to the central bank, these concerns are even more serious since the segmentation of the foreign exchange secondary market does not allow the non-tradable sector to hedge its currency exposure (Rossini and Vega, 2008).

The third and fourth terms, respectively, include the changes in the bilateral real exchange rate for the balance sheet effect, and a multilateral real exchange rate for the net export channel. These are of opposite sign: to explain this, we can consider that depreciation can induce positive effects through the export channel, but will have negative implications through the balance sheet channel. The central bank acknowledges that this is an approximation since both effects are non-linear and asymmetrical with respect to appreciations and depreciations.[46]

[46] The model also includes another term which is not reported in equation (3) related to the effects of fiscal impulses to the economy. The error terms will include all possible external shocks like terms-of-trade or sudden world GDP drops.

In the second equation, the aggregate supply follows the standard version used for an open economy: it includes the effects of imported inflation, but there is no particular reference to dollarisation.

$$\pi_t = g\pi^{noncore} + (1-g)\pi^{core} \quad (4)$$

where inflation core in a abbreviated form is:

$$\pi^{core} = b_m\pi^m_{t-1} + (1-b_m)f(E\pi, \tilde{y}) \quad (5)$$

where imported inflation (pass-through) is a function of this type:

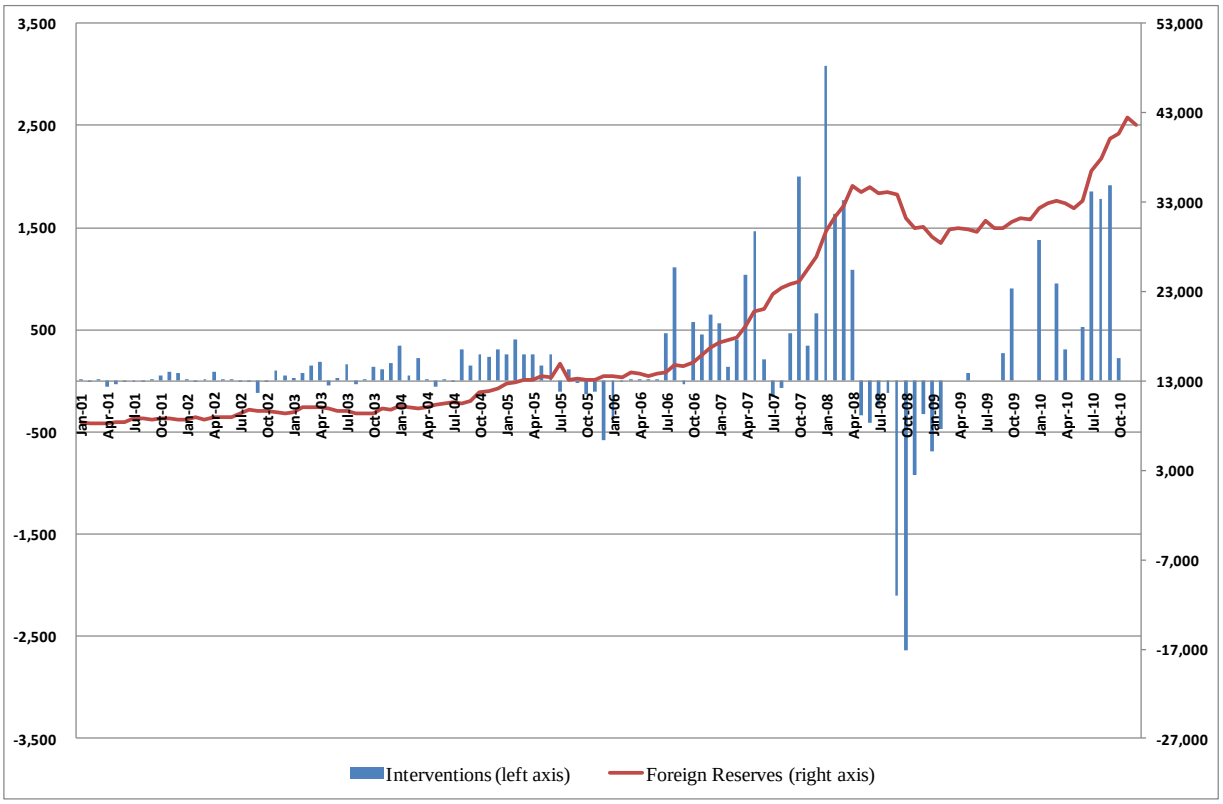
$$\pi^m_t = f\,(\pi^{non-core\ fuel}, Foreign\ Exchange, Foreign\ inflation) \quad (6)$$

The last equation, not included here but discussed in the literature review, the Taylor rule, maintains his standard form to determine the nominal interest rate.

To sum up, as highlighted in chapter 2, when the IT model is adopted for a dollarised economy there are two main features which stand out: firstly, the only place where dollarisation can be included remains the IS equation. Secondly, foreign exchange interventions to smooth the volatility of the exchange rate are a very important and effective policy instrument. The interventions of the BCRP during the period are shown below (Figure 5.5). Therefore:

"It is important to notice that interventions are symmetrical in terms of directions as the BCRP aims to show its commitment to the exchange rate policy." (Marco Vega, Deputy Manager, Economic Research at BCRP interviewed at the BCRP, translated by the author)

Figure 5.5: BCRP interventions in the foreign exchange market and reserve accumulation (Millions of US$) (2001-2010)



Source: BCRP (2011)

The operational problem of intervening in the foreign exchange market is due to its sterilisation given that one instrument (CDs) is used for two purposes (sterilization and control of interest rates) simultaneously:

"The issuance of CDs to sterilise intervention may move away the interest rate from its target. This limitation implies that the BCRP may decide not to sterilise when interventions are very significant favouring a possible increase of inflation. There is a trade off inflation-intervention." (Marco Vega, Deputy Manager, Economic Research at BCRP interviewed at the BCRP, translated by the author).

In summary, this section explained the monetary policy implemented by the Central Bank of Peru since its independence: the distributional implications of these policies in terms of sectors and business ownership will be discussed in the next Chapter.

In the next section I will analyse the above periods using the flow of fund analysis.

5.4 Bridging the real and the financial side: a flow of fund analysis

The aim of this section is to provide an alternative interpretation of the Peruvian business cycle for the periods discussed so far. The flow of funds analysis will explore the link between the real and the financial realms and will shed some light on the functioning and structure of the Peruvian economy to be used in the next chapter. The main finding is that factors related to credit availability and financial flows significantly influenced the real side of the economy during the period: they contributed to both inflation, until late 1980s, and to stabilisation, later. The bridge between finance and real has a significant impact during the commodity boom.

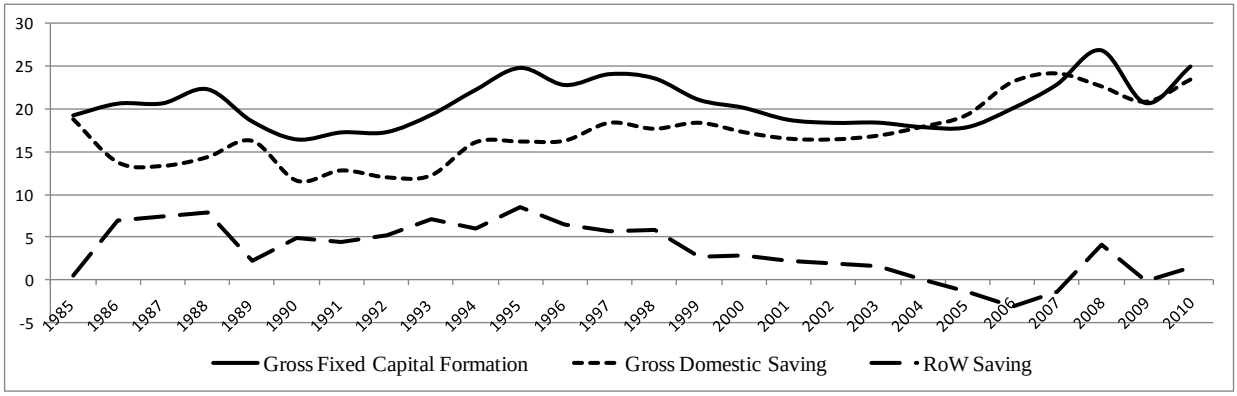
Following the method described in the previous chapter, the analysis starts with the aggregate level, it continues by disaggregating the different sectors and it closes by analysing in detail the instruments used to finance each sector. There are three broad periods: the 1980s with the raise of dollarisation and hyperinflation, the 1990s characterised by the Fujimori administrations with the reforms of the fiscal and monetary policies, and, finally, the 2002-2010 period in which inflation targeting was adopted while the economy experienced a commodity boom.

5.4.1 Analysis of the investment-saving gap at aggregate level

At aggregate level, saving and investment are analysed for the domestic sector and for the rest of the world sector. Figure 5.6 shows gross capital formation as a proxy of domestic investment, gross domestic saving and the rest of the world saving are defined as current account

balance with a negative sign. The saving investment gap appears to be negative throughout the period until the commodity boom.

Figure 5.6: Fixed capital formation and saving (percentage of GDP) (1985-2010)



Source: BCRP (2011), IMF (2011)

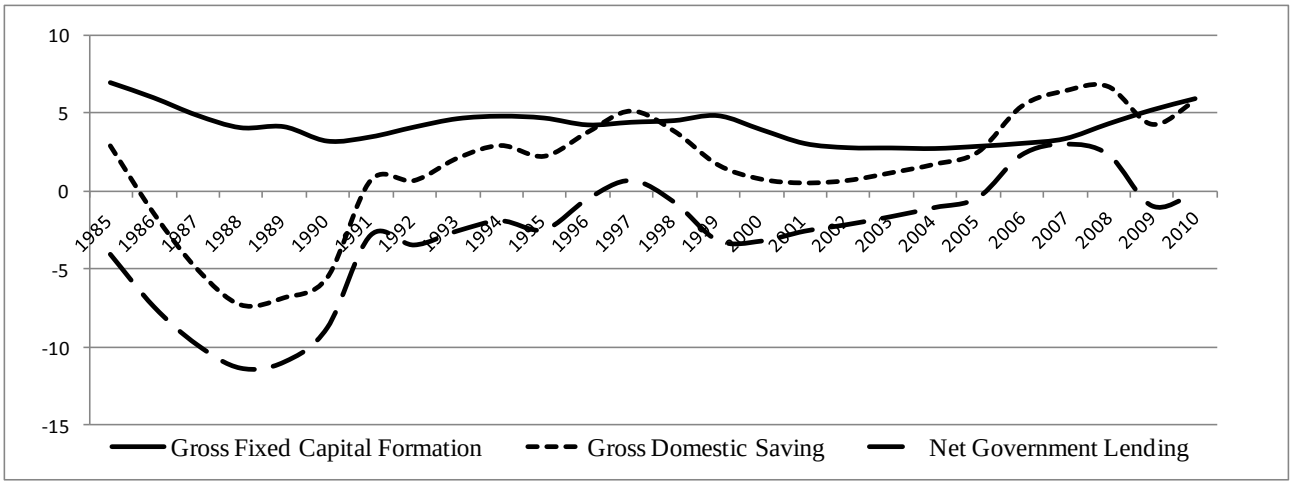
The period of higher dependence on the rest of the world saving is in the late 1980s under the García regime (1985-1990) and during the first Fujimori government (1990-1995). The increase of investment during the first phase of the Fujimori government is evident, but it declines constantly until the last period with the commodity boom, saving and investment increased approximately to the level of 25 percent f GDP.

5.4.2 Analysis of the investment-saving gap at sector level

The analysis starts by deriving the flows between the Peruvian economy, which is divided into two parts (public and private sectors), and the rest of the world. For each sector the analysis presents the net lending positions as the difference between the sector's gross domestic saving and gross fixed capital formation.

Starting from the government sector, Figure 5.7 shows that the level of gross fixed capital formation has been constant over time, at around five percent of GDP. The increase of government borrowing during the second half of the 1980s is matched by a decrease in saving reflecting the expansionary stance of the government. Unsurprisingly, mainstream economists blamed a badly managed expansionary fiscal policy for the increased borrowing to recommend a policy (and government) change (Parodi Trece, 2000): during the Fujimori administration, the lending position has always been kept close to zero because of the fiscal discipline and an improved tax collection. However, gross domestic saving followed pro-cyclically the development of the Peruvian business cycle: the government moved from a net borrowing to a net lending position at the end of the 1990s, and then returned to a net lender position during the commodity boom.

Figure 5.7: Government fixed capital formation and saving (percentage of GDP) (1985-2010)

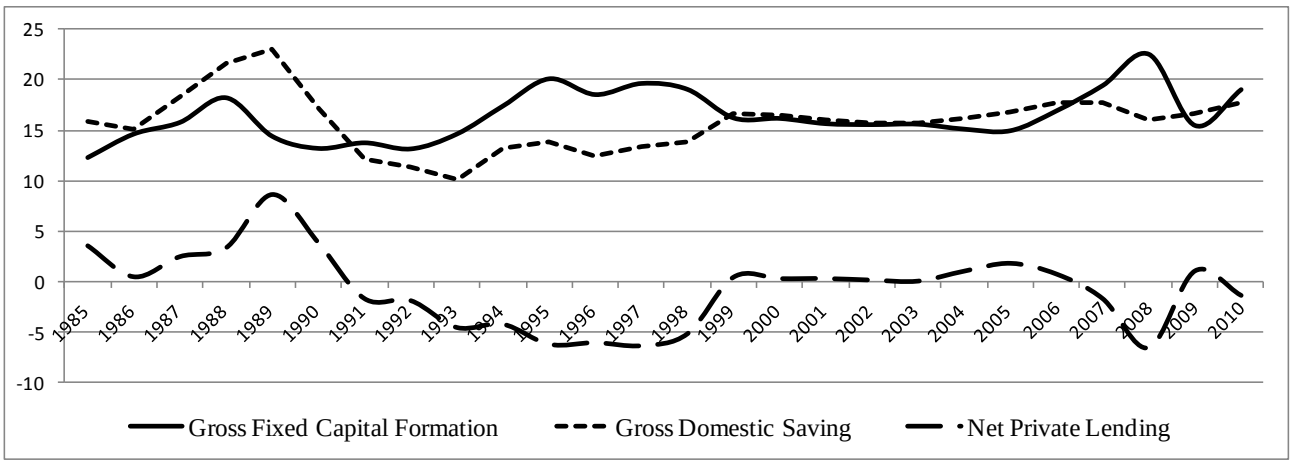


Source: BCRP (2011), IMF (2011)

The analysis of the private sector in Figure 5.8 shows the moment during the García's government in which the pact with the 12 major conglomerates failed: investment mildly increased until 1988 and declined rapidly afterwards. It is interesting to notice that during this period saving increased. This could be explained with the restrictions on dollar deposit, but it

may have also been the symptom of a missing synchronisation between the financial and the real sectors: despite an increase in saving, investment, measured as gross capital formation, declined. After 1998, investments declined significantly, but the private sector continued to save. Only with the rise of inflation and the capital flight, savings declined dramatically until 1991, when, with the first Fujimori administration, private investment resumed and, thanks to capital inflows, the economy experienced negative gross domestic savings. However, in 1997-1998, the international financial turmoil interrupted this trend which resumed only after the start of the commodity boom in 2005-2006.

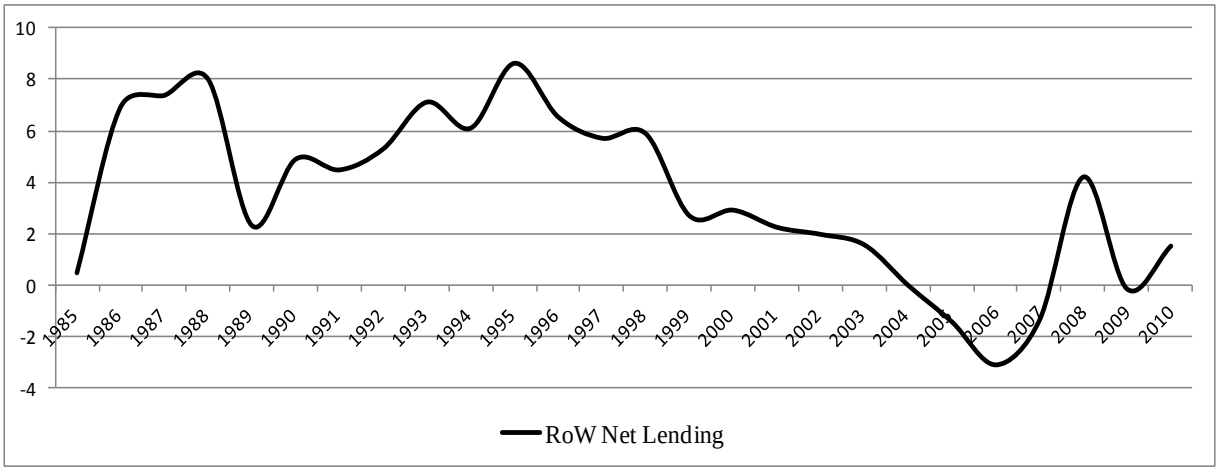
Figure 5.8: Private sector fixed capital formation and saving (percentage of GDP) (1985-2010)



Source: BCRP (2011), IMF (2011)

Finally, the net position with the rest of the world (Figure 5.9) was consistent with what has been said so far, Peru maintained its position of net borrower through the whole period; it became net lender only during the commodity boom. Borrowing increased especially during the first part of the García mandate in 1986-87 and during the first period of the Fujimori administration when Peru experienced a huge influx of capital. A more detailed analysis follows in the next section.

Figure 5.9: Rest of the world net lending (percentage of GDP) (1985-2010)

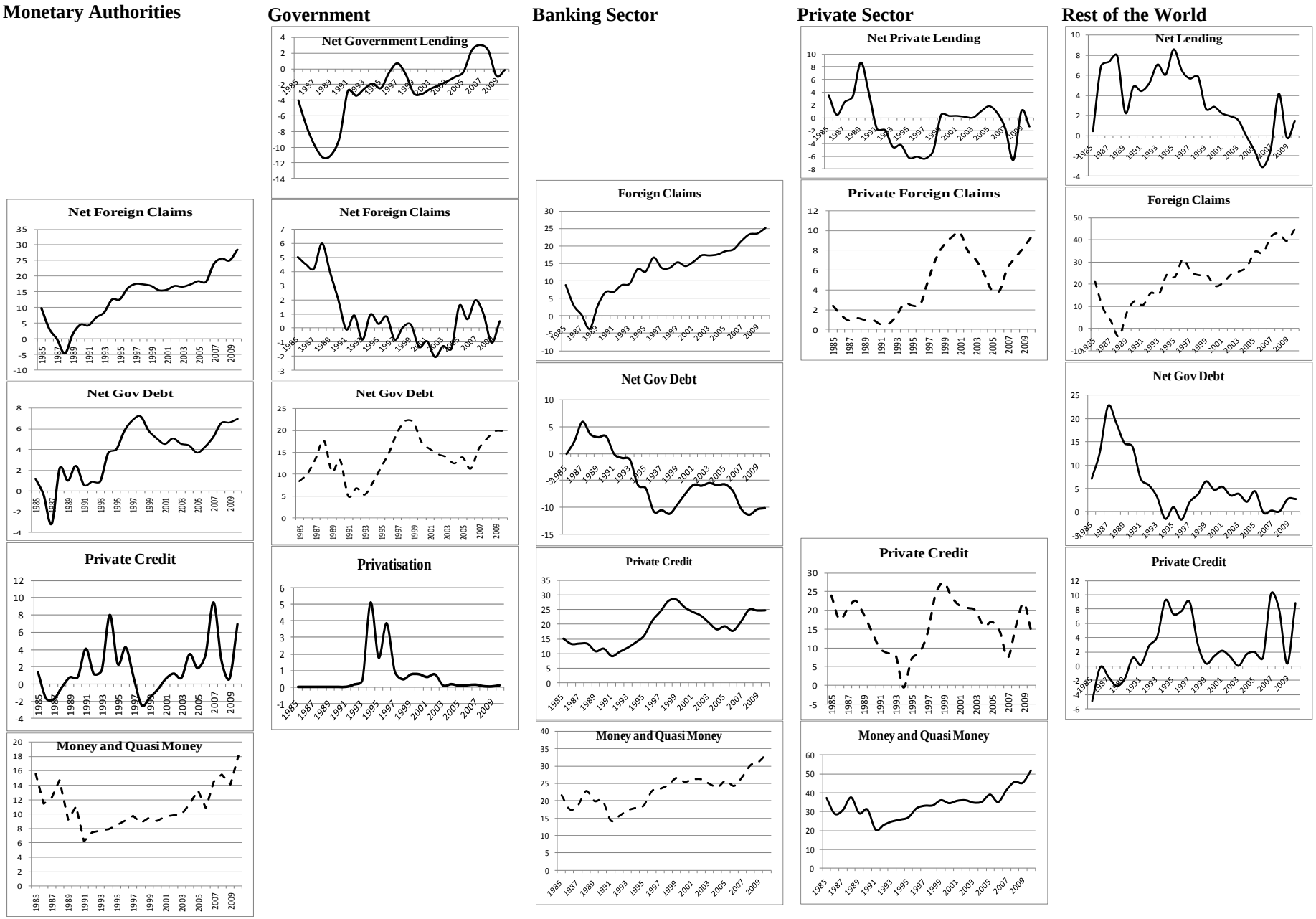


Source: BCRP (2011), IMF (2011)

5.4.3 Analysis of the financial instruments for each sector

For each sector the investigation continues by analysing the financial instruments involved in the net lending positions. I will illustrate each sector and each instrument in Figure 5.10 which shows sources and uses of each sector's net balance and the development of the flow of funds matrix described in Table 4.1 (Appendix A shows the matrices for each year). The dotted line represents a sector's liability (borrowing flows) which must be equal to the total sum of the instrument used for each sector, given by the solid lines (lending flows). The flow of funds analysis will follow the periodisation illustrated in the previous section.

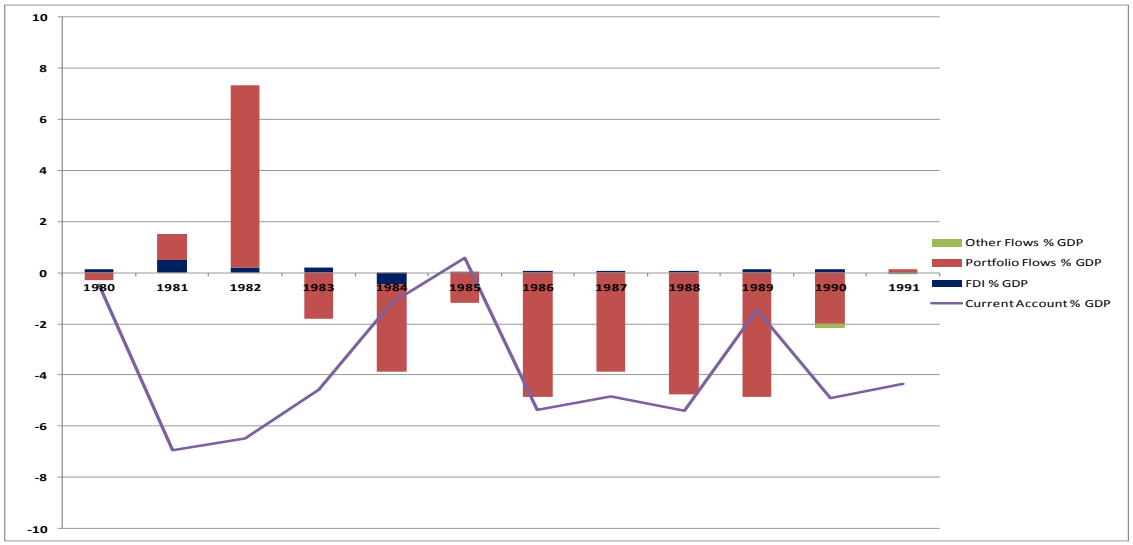
Figure 5.10: Flow of funds Peru



Starting the analysis for the period which led to the hyperinflation, the flow of funds matrix (Figure 5.10) shows that the García's government net lending position (see second column from the left hand side named Government) were financed by exceptional funds (debt reschedule or refinancing) in foreign currency and by issuance of government debt in domestic currency (shown by the second and third rows, government net foreign claims and net government debt respectively). When García declared that he had no intention to recognise the external debt accumulated by his predecessor, foreign banks (mostly US) activated a hard currency flight. The decline of foreign exchange reserves shows the effort of the central bank to contain the devaluation of the inti (first column, second row).

With respect to the private sector, private claims and net lending positions of the rest of the world (financial account and reversed current account) of the 1980s show that capital flight was a standard practice. The progressive increase of dollarisation reported in the previous section happened in conjunction with an almost constant capital flight and current account deficit which constitute an important determinant to the devaluating pressure and imported inflation (Jimenez, 2010).

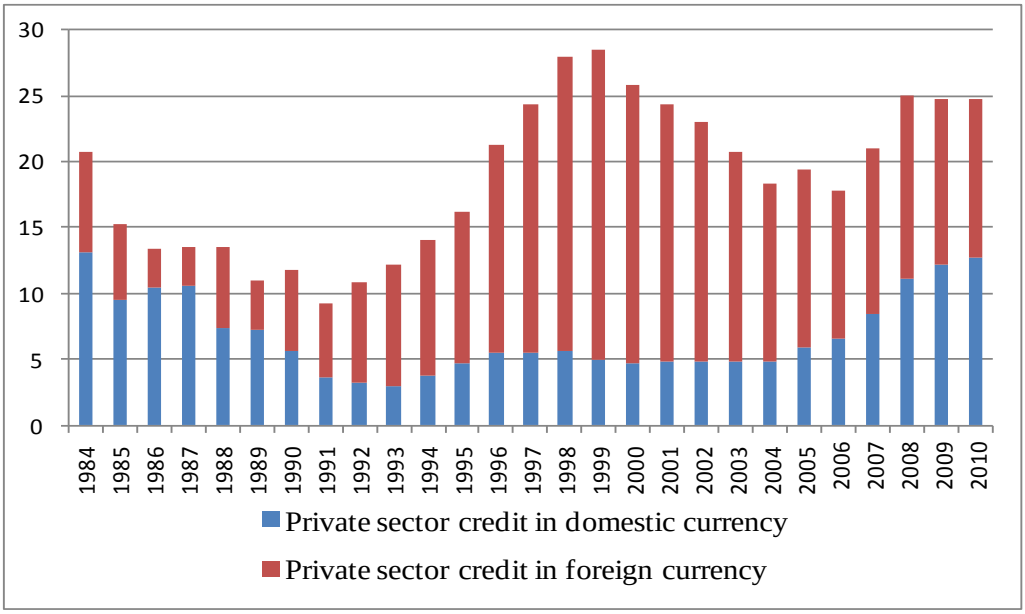
Figure 5.8: Financial account and current account (percentage of GDP) (1980-1991)



Source: IMF (2011)

The combination of capital flight and the shrinkage of credit/money represented the perfect storm. For this reason, at the end of the 1980s, the pact with the 12 conglomerates to guarantee the liquidity of the credit system was crucial. In order to understand this point, it is necessary, following the discussion in the methodological chapter on the inclusion of dollarisation, to break down the composition of both credit and money flows in domestic and foreign currencies. Observing Figure 5.11, which shows the private credit in both currencies, it is clear that credit was cut off when the pact was broken in 1987 until the government resigned as a result of an economic crisis. Credit started to resume only from 1992, but just in dollars, leading to a further increase in dollarisation.

Figure 5.11: Private sector credit in domestic and foreign currency (percentage of GDP) (1984-2010)

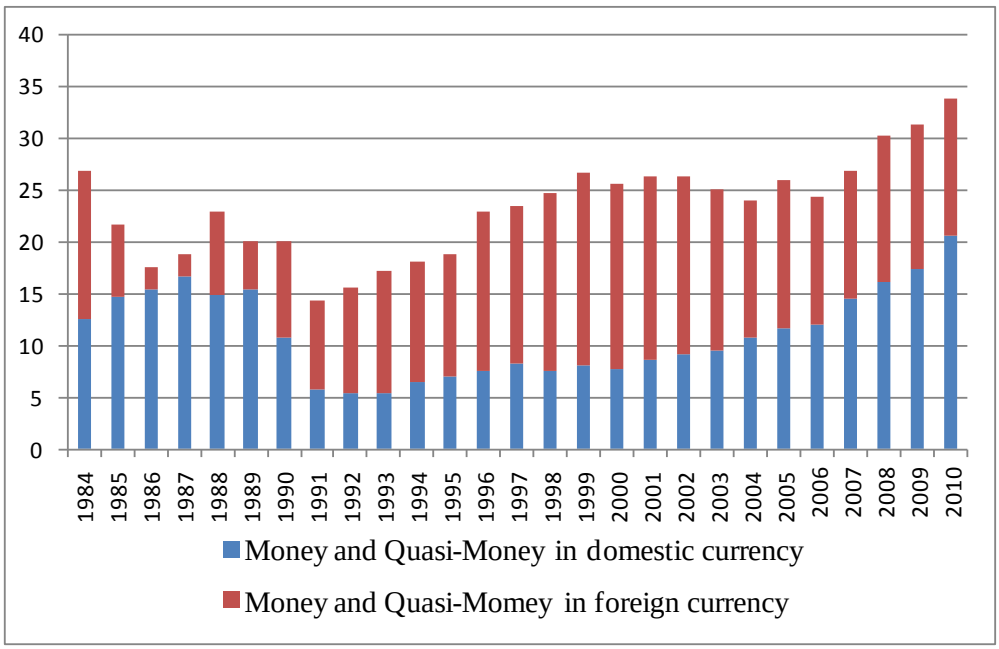


Source: BCRP (2011)

Money aggregates in both domestic and foreign currencies in the banking system provided in Figure 5.12 confirm the picture. From 1987 to 1991, money in domestic currency

declined progressively and increased only later, during the commodity boom. Overall, the central bank tried to maintain the control over domestic money during the 1990s in order to stabilise inflation.

Figure 5.12: Money and quasi-money in domestic and foreign currency in the banking system (percentage of GDP) (1984-2010)

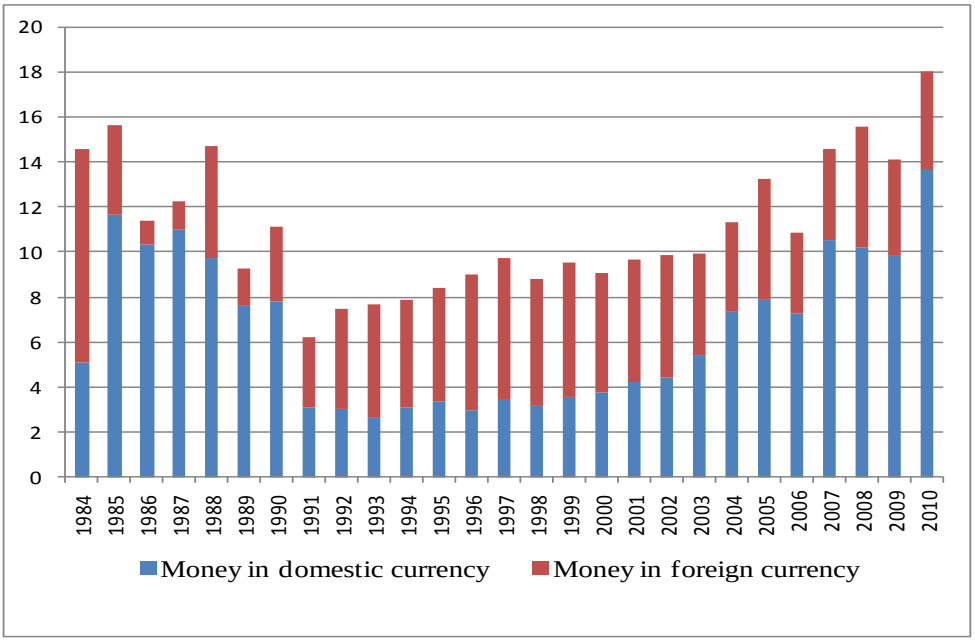


Source: BCRP (2011)

However, the distinction between the two currencies implies further considerations: the total amount of money in both currencies did not change significantly until 1989; an expansion of the monetary base in the domestic currency happened between 1985 and 1987, but it was too small to justify hyperinflation. Similarly, the decrease in the monetary base started in 1987 did not cause any decrease in inflation. On the contrary, inflation continued to increase; furthermore, the lack of credit after 1987 cannot be explained in terms of liquidity preference if only the domestic currency is considered. Since money growth was not the culprit, then capital flights and

credit restrictions to the private sector by the banking sector had to play a crucial role. In the end, higher liquidity preference was not in domestic currency, but it was in dollars (see figure 5.13).

Figure 5.13: Monetary base in domestic currency and money in foreign currency at the BCRP (percentage of GDP) (1984-2010)



Source: BCRP (2011)

As a consequence, rather than a result of fiscal discipline, like the International Financial Institutions had sustained (Singh, 2006), hyperinflation was a more complex phenomenon strongly conditioned by credit and money available in both currencies.

From the flow of funds matrix, it is also possible to see the policy changes after the election of Fujimori: the opening up of the capital account initiated a reversal of the process with the expansion of credit and the increase of money in circulation. The new government marked an increase in liquidity as foreign banks, and their dollars, returned in conjunction with expectations of renewed business profitability of the major conglomerates. The rest of the world could finance the government buying government by dollar-denominated debt so that the foreign-claim

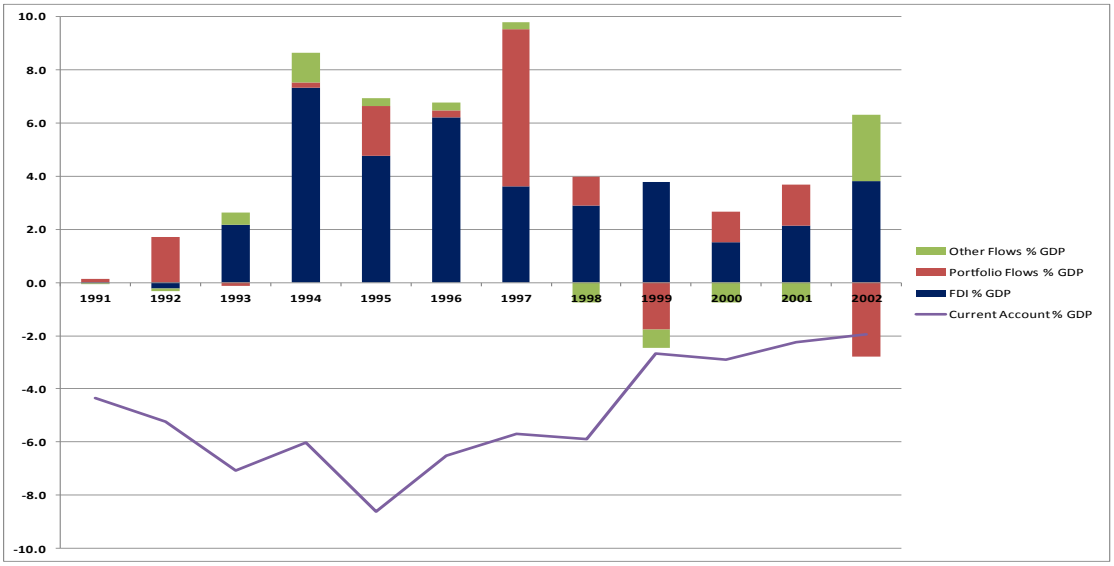
position reached a negative balance as soon as the effect of exceptional finance disappeared. The position continued to deteriorate until the commodity boom period (second row, net foreign claim, of Figure 5.10). The central bank managed to maintain the monetary base relatively under control thanks to foreign capital inflows into the country (private claims of the rest of the world, fourth row).

Thus, with the liquidity problem solved, hyperinflation disappeared. Following the practice of the IFIs, the government lending position was balanced by cutting expenditure; this reduced public investments to less than five percent of GDP, by increasing and improving tax collection, and by privatising (fourth row in Figure 5.10).

During the second period of the Fujimori administration (1995-2000), the economic performance declined into a long recession (1998-2001), domestic money as a percentage of GDP remained unchanged (Figure 5.12) and the foreign currency was the only source of credit growth (Figure 5.11): the increased amount of foreign claims of the private sector is also shown in the flow of funds matrix (Figure 5.10). Essentially, there was an increasing financing gap opening up for non-financial firms: since Fujimori took power in 1992, non-financial firms became increasingly dependent on external financing which decreased only in 2000. They were forced to search for external funding to compensate for the loss of revenues generated by the economic slowdown, and, especially those who could not generate dollar revenues, were penalised by an appreciating foreign currency. This aspect will be further investigated in the next chapter.

The rest of the world positions show that, during the period 1991-1997, foreign capital funded a large negative current account position. After this, the international financial crisis marked a decrease in financial inflows leading to a recession, as reflected in a narrower current account deficit position (see Figure 5.14).

Figure 5.14: Financial account and current account (percentage of GDP) (1991-2002)

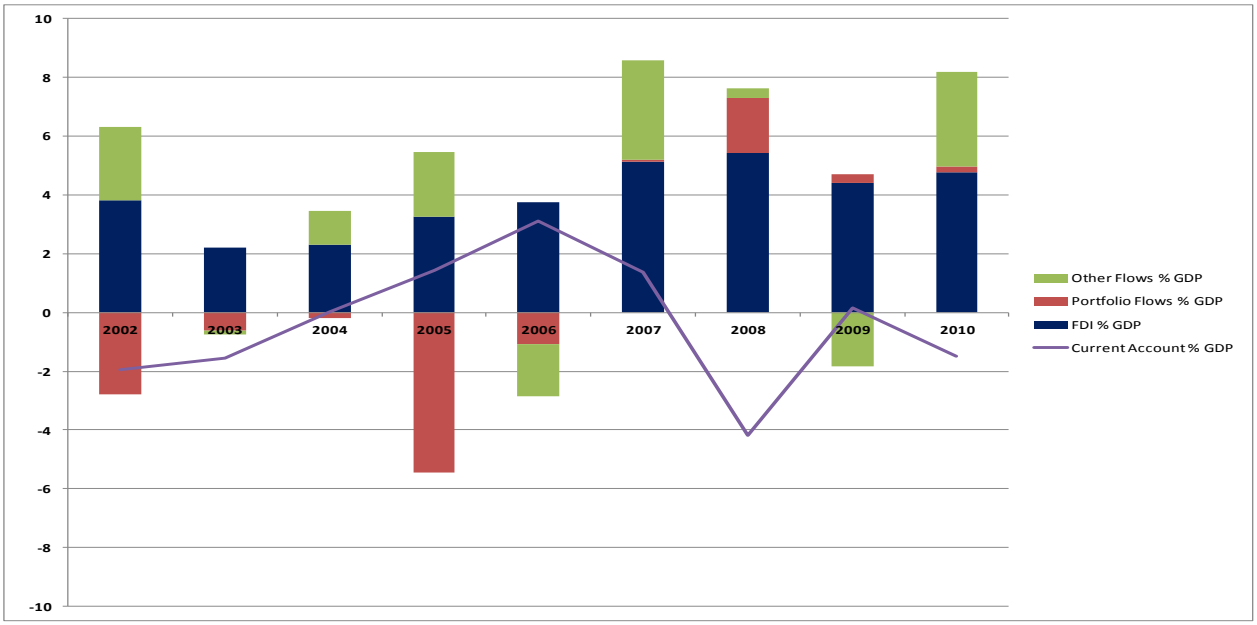


Source: IMF (2011)

As discussed, the third period is marked by the adoption of the inflation targeting framework and the start of the commodity boom. Consistently with the development of the new monetary framework, the main funding policy was the development of a domestic bond market, especially after 2007, while the outstanding amount of external debt of the private sector diminished (fourth column, fourth row, Figure 5.10). As expected, government revenues increased during the boom leading to an increase of savings and capital expenditure (second, column, first row).

During this last period the dynamics of the rest of the world sector changed dramatically. Figure 5.10 shows how the sector became net borrower. However, the sector continued to increase its stock of foreign claims, the external debt of the private sector and to fund the private sector through private claims. The increase of the external debt in the private sector will be discussed and analysed further in the next chapter. The increase of private claims (FDI and portfolio flows) and the changes in the net lending position (the current account) are illustrated in the following figure (Figure 5.15):

Figure 5.15: Financial account and current account (percentage of GDP) (2002-2010)



Source: IMF (2011)

The flow of funds analysis assesses how the real and financial sectors evolved since the first days of the hyperinflation period. Specifically, it allows us to understand the effects of the flows of credit and money in both domestic and foreign currencies on the real side of the economy and the consequent limited role of the monetary policy. This will be discussed further in the next section which focuses on central bank policies since its independence. The policy can be summarised by the ideas of internal and external liquidities, as defined in the previous chapter. The importance of identifying these two factors is crucial to explain the actions of the central bank and the effectiveness of its monetary policy: given a highly dollarised economy, the policy should be oriented towards two main aims, namely, guaranteeing credit availability and liquidity of domestic and foreign money, and smoothing the exchange rate fluctuations.

5.5 Monetary Policy as an Internal and External Liquidity problem

This section applies the framework identified in chapter three to the Peruvian monetary policy. Empirically, I consider two measures of liquidity: the internal one given by the changes in M2 year-on year of domestic money, and the external one provided by the absolute value of intervention per year in millions of US dollars.[47/48] The two measures are provided in graphical terms in Figure 5.16.

A decline of both base money and broad money growth can be observed during the process of inflation stabilisation during the 1990s. This indicates that the focus of the monetary policy in terms of internal liquidity was the control of money growth during a period of deflation (see dotted line Figure 5.16). In terms of external liquidity, the central bank intervened modestly during the 1990s and more intensively from 2003 onwards (Figure 5.16).

However, liquidity dried up with the international financial turmoil. During these years, monetary policy was not activated to stimulate the economy: there was no change in money growth and credit (see Figure 5.16), and no central bank smoothing intervention was assumed to be needed, given the stagnation of both real and financial activities. Eventually, the interbank interest rate declined in 2001, when the central bank started to change its target.

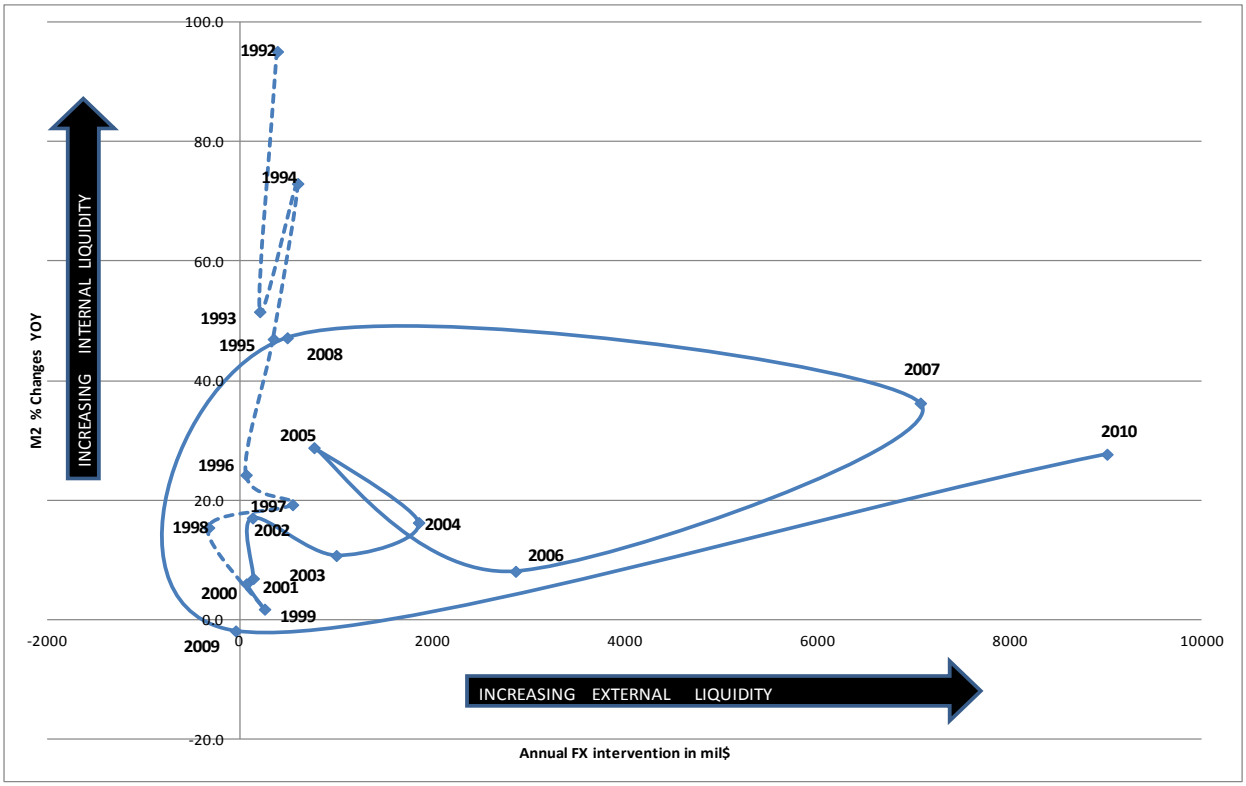
In the post crisis period, money growth remained contained while the size of intervention rapidly increased. Finally, both liquidities increased until 2007, when with the Great Recession, there was a sudden drop of international trade and financial flows. Once again, interventions and money growth turned out to be pro-cyclical and both were heavily reduced; as a result, the overall liquidity moved back towards the origin as it happened in the previous economic stall in the late 1990s.

However, the interest rate channel had to be activated in conjunction with the interest rate of the rest of world. Furthermore, monetary policy had to be coordinated with a stimulative fiscal

[47] The result is the same whether one considers a broader measure of money in which also dollars are included. Also, given the process of deflation, real data show the same declining patterns of nominal figures during the 1990s.
[48] The reason why I take the absolute value of interventions summing both sales and buys of US dollars is that the central bank intervenes only to smooth the exchange rate fluctuations without changing the trend. This measure can then give an idea of the overall interventions of the central bank.

policy: this is showed in the deteriorating government's net lending position of the flow of funds matrix (Figure 5.10). Moreover, the sudden halt of the system during the commodity boom provides further confirmation that the quantity of credit and money, which depended also on foreigners' behaviour, was as important as the price of money. After the co-ordinated worldwide governments' intervention in 2010, the economy was fully functioning again as shown by the liquidity chart in the figure below (top right of the quadrant).

Figure 5.16: Changes in M2 year-on-year versus absolute value of interventions (1992-2010)

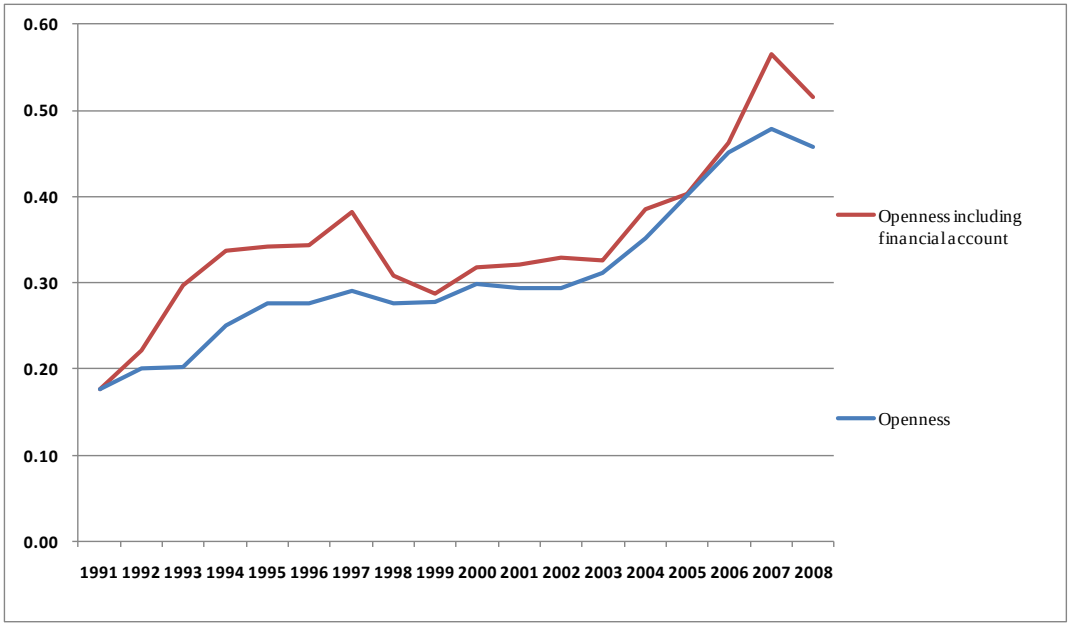


Source: author's calculation on BCRP (2011) data

Finally, the chart shows a sudden change in the size of the central bank interventions: the increase of external liquidity was driven by the increased pressure on the exchange rate since 2003, when the trade balance started to improve dramatically because of the commodity

revenues. The rapid increase in interventions between 2005 and 2007 is explained not only by the trade balance, but also, and even more, by the financial account (Figure 5.15, Figure 5.17).

Figure 5.17: Openness of the Peruvian economy (1991-2008)



Source: IMF (2011)

The exchange rate risk, for example, has been high only in the late 1990s, and depreciation has been relatively contained since. Unlike other Latin American countries which experienced dramatic episodes of monetary instability (for example, Brazil in 1998, 1999, and Argentina in 2001), the Peruvian economy enjoyed almost twenty years of relative monetary stability with respect to both inflation and the exchange rate. Despite this stability, however, it is only recently that the economy has been growing constantly and at significant rates. Only during these recent growth years, the dollarisation ratio, which has been stable and high until the commodity boom, started to decline (Table 5.15).

Table 5.15: Dollarisation, inflation and changes in exchange rate (percentage) (1992-2010)

	Dollarisation Ratio of Broad Money In Peru	Inflation	Change in Currency (-depr.)
1992	65	73.5	-41.1
1993	69	48.6	-24.5
1994	64	23.7	-0.9
1995	63	11.1	-6.1
1996	67	11.5	-10.6
1997	65	8.6	-5.2
1998	69	7.2	-13.2
1999	70	3.5	-10.1
2000	70	3.8	-0.5
2001	67	2.0	2.4
2002	66	0.2	-2.0
2003	64	2.3	1.5
2004	57	3.7	5.0
2005	54	1.6	-3.6
2006	51	2.0	7.1
2007	47	1.8	6.6
2008	46	5.8	-4.6
2009	42	2.9	8.7
2010	38	1.5	2.9

Source: BCRP (2011), IMF (2011)

Moreover, consistent with the theory presented in chapter 3, the reduction of dollarisation may be due to expectations of appreciation of the local currency, given the commodity boom. However, this dissertation will discuss, in the next chapter, that the eradication of dollarisation can only be guaranteed by the development of a non-traditional export sector. This is in open polemic with mainstream economists (García-Escribano and Sosa, 2010), who believe that floating exchange rate, inflation targeting, and the development of the domestic bond market may achieve a financial-side led de-dollarisation process.

5.6 Conclusions

This chapter showed that, since Peru is an open and highly dollarised economy, monetary policy intended in its mainstream interpretation, either in a money target or inflation target version, is inadequate since it is not able to cope with dollarisation in an effective way. Pragmatically, the central bank of Peru has tried to influence the dollar use and liquidity of dollar money by intervening in the forex market. Formally, the BCRP has been able to incorporate the exchange rate in their model, but this aspect remains at odds with the standard formulation of the IT framework.

In reality, the money issues related to a dual monetary system require a more complex institutional framework than the one assigned by the conventional current central bank set up. To reach this conclusion a more profound understanding of the links between the real and financial side of the economy has been necessary: to this end, the flow of funds method has been used. Following this analysis, an alternative interpretation of the causes of the hyperinflation and the following stabilisation process emerged. In a nutshell, the Peruvian destabilising forces had nothing to do with excess fiscal spending and inadequate monetary policy. Rather, it was a matter of capital flight, credit availability and liquidity preference between domestic and foreign currency.

From the flow of funds analysis, monetary policy can be framed as a dual choice between internal and external liquidity and the managing of these two parts. This new lens allows describing the action of the central bank since its independence. In compliance with its mandate, it appears that the central bank only concentrated on controlling money growth during the period of inflation stabilisation, and, unconventionally, avoided excess volatility of the exchange rate. The effect of this exchange rate policy will be investigated in the next chapter.

Furthermore, the liquidity framework of the previous section showed that the central bank appeared to be powerless during the recession at the end of the 1990s; despite the switch to IT, it appeared to be ineffective during the sub-prime crisis in 2009. The ineffectiveness of the monetary policy in dealing with period of recessions appeared to be common feature throughout the period under consideration. Overall, the combination of a dollarised economy and the

dependence on money and credit availability, which is undermined by a banking/financial system linked to large conglomerates and foreign capital, have a fundamental role in the shape of the Peruvian business cycle. The change in the structure of the Peruvian economy will be the focus of next chapter where a brief discussion of the impact of the concentration of economic and political power of the Peruvian conglomerates on policy making is also presented.

Chapter 6 -The effects of RER policy on firms investments and on the structure of the economy in Peru (1991-2010)

6.1 Introduction

The present chapter focuses on the relationship between the real exchange rate fluctuations, smoothed by the central bank interventions, and the business cycle of the Peruvian economy between 1991 and 2010. The aim is to understand whether the exchange rate policy adopted had an effect on firms' behaviour and the structure of the economy in terms of a more diversified export base. Available macro data are limited, so I integrate them with a micro analysis of 117 non-financial firms which allow me to make relevant inference on the balance sheets and ownership of these firms.

In this chapter RER price patterns are analysed for the period 1991-2010 in order to set different phases of the business cycle. I have identified four phases depending on the price trend and volatility of the bilateral RER versus the US dollar.

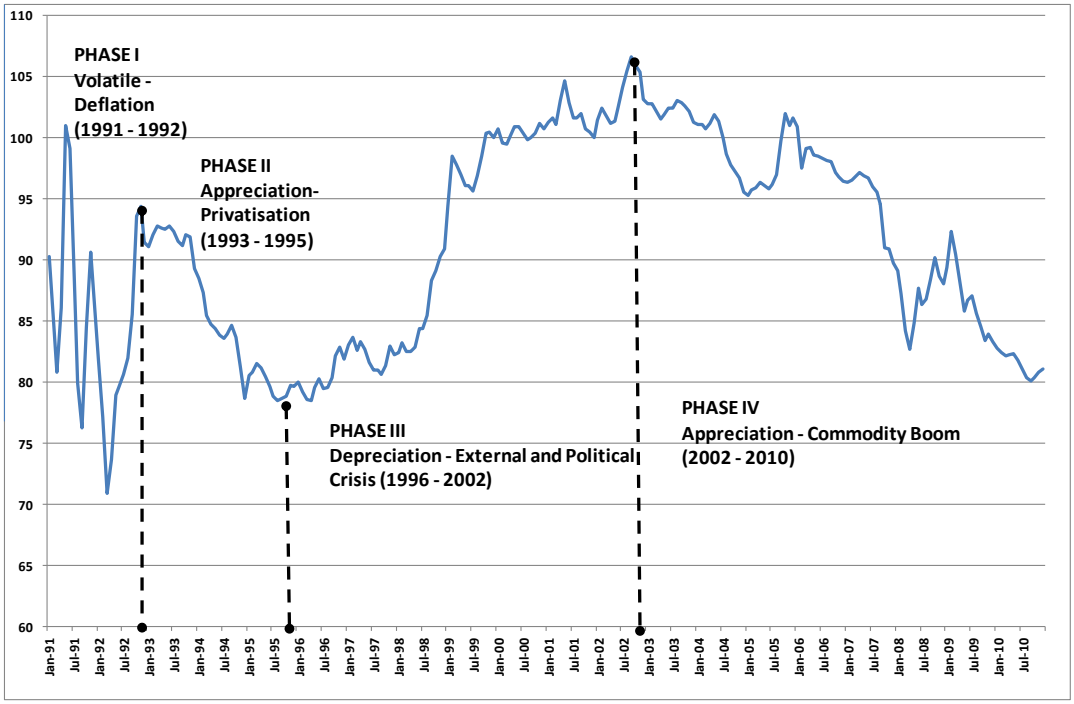
The chapter is divided in five sections. A part from this introduction, the second section aims to establish what factors affect investment. An investment function estimates whether the RER can be one of the factors through a balance sheet effect. The third section deepens the investigation through a business cycle analysis which is conducted at different levels according to three types of categorisation of the data set: analysis of different activities by sectors, analysis of the tradables and non-tradables sectors, and analysis of different types of ownerships. The fourth section focuses on the structural development of the Peruvian economy during the entire period. The fifth section draws the conclusions by summarising the findings of the chapter.

6.2 The effects of RER fluctuations on non-financial firms' investments

The chapter follows a periodisation shown in Figure 8.1. The first period, from the beginning of 1991 to the end of 1992, was characterised by a very volatile RER. This depends on

large depreciations and the deflation that took place during the structural adjustments programme at the beginning of the Fujimori's government. In a second phase, from 1993 to 1995, the RER appreciated mostly because of the large capital inflows attracted by the macro stabilisation programme. The nominal exchange rate and inflation started to stabilise, while the economy experienced an annual average real growth of eight percent over the three year period. The third period spans from 1996 until about September 2002 when the RER depreciated and the economy contracted first and then stagnated between 1998 and 2001. This period was characterised by external international financial crises and the domestic political turmoil of the early 2000. The last phase ends in 2010, during which the exchange rate appreciated during the commodities price boom.

Figure 6.1: Price patterns and phases definitions of the Bilateral RER (1991-2010)



Source: BCRP (2011)

Generally, the empirical literature on the effects of the RER tends to focus on the performance of an economy in terms of growth. The theory suggests that RER devaluations have two opposite effects, an expansionary one caused by increasing competitiveness, and a contractionary one caused by firms' currency mismatch between assets and liabilities, the so called balance sheet effect. This literature identifies a short-term contractionary effect during depreciations followed by an expansionary effect in the medium/long run (Kamin and Roger, 1997 on Mexico; Hermet, 2003 on South Korea; Bonomo and Martins, 2003 on Brasil; Tovar, 2005 on South Korea; Benavente et al., 2003, on Chile). Works on Peru on the effect of RER depreciations on the investment ratio of non-financial firms, between 1990 and early 2000 (Phase I, II and III of Figure 6.1) reached similar results: currency depreciations negatively affect firm's investment behaviour as the balance sheet effect dominates the competitiveness effect (Rodriguez and Diaz, 1995; Carranza et al., 2003, Saldaña and Velasquez, 2007).

Following the above empirical studies, I extend the period including Phase IV when the RER appreciates during the commodity boom. In this way, I will compare the results over two distinct parts of the exchange rate cycle, a period dominated by RER depreciation (1993-2002) and a period of appreciation (2003-2010), to see whether the effects on the investment ratio are symmetrical.

The specification of the model is:

$$I_t = \alpha_0 + \alpha_1 I_{it-1} + \alpha_3 \Delta RER_t + \alpha_4 D_{it-1} + \alpha_5 Sales_{it-1} + \alpha_6 Lev_{it-1} + \theta_t + \pi_t + \varepsilon_{it} \quad (1)$$

I= investment ratio given by $\frac{K_t}{K_{t-1}} - 1$, where K is the stock of investment

ΔRER_t = variation of Real Bilateral Exchange Rate in log terms

D_{it}= ratio of dollar debt over total asset for each firm

$Sales_{it}$= log of sales value for each firm

Lev_{it}= leverage ratio for each firm (total debt over total asset)

θ_t= time dummies

π_t= firm specific effect

The inclusion of time dummies is used to control for all macro-variables given that α_3 may be capturing not only exchange rate movements but other factors such as aggregate credit conditions or political uncertainty.

In Table 6.1, I show the result for the first period (Phase I, II and III) by adopting different versions of equation 1 above in order to test for the various factors which might affect investment.

Table 6.1: Investment function results (GMM estimation – Sample 1991-2002)

Independent variables		**Equation1**	**Equation2**	**Equation3**	**Equation4**	**Equation5**
	log(RER)	-0.557*** (0.071)	-0.493*** (0.084)	-0.481*** (0.078)	-0.257*** (0.071)	
	Dollar debt ratio*log(RER)					-0.179** (0.091)
Firms Specific	Lagged Investment Ratio	0.744*** (0.019)	0.730*** (0.021)	0.736*** (0.018)	0.168*** (0.026)	0.704*** (0.020)
	Sales	0.086*** (0.023)	0.082*** (0.022)	0.084*** (0.022)	0.008 (0.011)	0.116*** (0.027)
	Lagged Leverage Ratio (Total debt/Total asset ratio)	0.226*** (0.070)	0.211*** (0.069)	0.210*** (0.071)	0.077*** (0.022)	0.192*** (0.064)
	Lagged Dollar Debt Ratio	0.058 (0.063)	0.073 (0.230)	0.075 (0.065)	-0.018 (0.032)	-0.015 (0.062)
Controls	Lagged ROA		0.082 (0.102)			
	Lagged Solvency Ratio			0.033*** (0.011)		
	Size (log asset)				0.736*** (0.087)	
Year Dummies						
	1997	-0.002 (0.017)	0.006 (0.018)	0.005 (0.017)	-0.006 (0.011)	0.020 (0.016)
	1998	0.128*** (0.018)	0.132*** (0.018)	0.129*** (0.018)	0.044*** (0.011)	0.123*** (0.018)
	1999	0.089*** (0.012)	0.088*** (0.012)	0.084*** (0.012)	0.034*** (0.009)	0.063*** (0.013)
	2000	0.047*** (0.009)	0.049*** (0.009)	0.048*** (0.009)	0.041*** (0.008)	0.025** (0.013)
	2001	-0.022*** (0.026)	-0.019** (0.008)	-0.017*** (0.008)	0.019*** (0.007)	-0.020** (0.011)
Regression Statistics	N. observations	928	927	927	928	925
	Sargan Test (J-statistic)	48.7	50.2	49.8	49.3	45.6
	p-value	0.48	0.42	0.44	0.42	0.61
	First order Autocorrelation	-0.51	-0.51	-0.51	-0.26	-0.47
	p-value	0.00	0.00	0.00	0.00	0.00
	Second order Autocorrelation	-0.10	-0.10	-0.11	0.04	-0.12
	p-value	0.11	0.11	0.10	0.62	0.00
Standard errors in parenthesis. */**/*** indicate statistical significance at the 10/05/01 level						

First, equation 1 reveals a negative relation between investment ratios and RER. This is in line with other studies mentioned above and leads to the conclusion that the balance sheet effect had a more important role than the competitiveness effect during the depreciation period. This could be explained by the fact that most of the tradable sector firms are in the manufacturing sector which is mainly oriented to the domestic market. As expected, sales are positively correlated with investment. The leverage ratio, whose coefficient is positive and significant, indicates that investment expenditure is strongly related to financing access. This confirms that, in the late 1990s, restricted financing conditions determined by the international financial turmoil had a negative impact on the Peruvian economy. Since a significant part of borrowing was in foreign currency, equation 1 also includes the lagged dollar debt ratio to check whether dollar liabilities had any particular effect: the coefficient is positive but not significant.

Second, the next equations (2, 3, and 4) include new controls such as firms' profitability, solvency and size. The lagged return on assets (ROA) has a positive sign, but is not significant. The lagged solvency ratio is both positive and significant. Lastly, following the idea that there may be a bifurcation in the credit market, so that big and small firms have access to different financing conditions, equation 4 has been created to verify whether investment depends on firm size as measured in (log) terms of total asset: the coefficient is highly significant; this induced me to further investigate this issue through a qualitative analysis illustrated below (in section 6.3.3).

Third, the existence of a balance sheet effect is additionally proven by equation 5 which shows the interaction term between the RER and the dollar debt ratio as statistical significant.[49] This, unlike the overall effect of the RER on investment, isolates the competitiveness effect from the balance sheet effect.

The year dummy variables take into account the period of international financial turmoil from 1997 to 2001; they capture macroeconomic conditions, factors that are common to every firm, such as domestic credit availability and political climate.

[49] Applied research often estimate interaction terms to infer how the effect of one independent variable on the dependent variable depends on the magnitude of another independent variable (Norton et al., 2004)

Table 6.2: Investment function results (GMM estimation – Sample 2002-2010):

Independent variables		Equation1	Equation2	Equation3	Equation4	Equation5
	log(RER)	-0.349*** (0.047)	-0.217*** (0.053)	-0.275*** (0.052)	-0.641*** (0.106)	
	Dollar debt ratio*log(RER)					-0.018*** (0.000)
Firms Specific	Lagged Investment Ratio	0.227*** (0.004)	0.243*** (0.004)	0.223*** (0.004)	0.167*** (0.003)	0.228*** (0.004)
	Sales	0.277*** (0.006)	0.274*** (0.006)	0.275*** (0.006)	0.160*** (0.009)	0.254*** (0.007)
	Lagged Leverage Ratio (Total debt/Total asset ratio)	-0.126*** (0.010)	-0.113*** (0.012)	-0.109*** (0.009)	-0.099** (0.014)	-0.106*** (0.013)
	Lagged Dollar Debt Ratio	0.179*** (0.009)	0.182*** (0.010)	0.164*** (0.008)	0.157*** (0.015)	0.194 (0.013)
Controls	Lagged ROA		0.290*** (0.006)			
	Lagged Solvency Ratio			0.031 (0.003)		
	Size (log asset)				0.361*** (0.006)	
Year Dummies						
	2003	0.020*** (0.001)	0.018*** (0.001)	0.021*** (0.001)	0.018*** (0.001)	0.025*** (0.001)
	2004	-0.009 (0.004)	-0.006 (0.004)	-0.006 (0.004)	-0.040*** (0.009)	0.020*** (0.002)
	2005	-0.043 (0.003)	-0.053*** (0.004)	-0.045 (0.004)	-0.056*** (0.003)	-0.035*** (0.003)
	2006	-0.076*** (0.005)	-0.090*** (0.005)	-0.076*** (0.005)	-0.120*** (0.009)	-0.048*** (0.004)
	2007	-0.102*** (0.008)	-0.129*** (0.008)	-0.101*** (0.008)	-0.195*** (0.018)	-0.043*** (0.005)
	2008	-0.000 (0.009)	-0.022 (0.010)	0.002 (0.001)	-0.140*** (0.018)	0.066*** (0.005)
	2009	0.038*** (0.010)	0.033*** (0.010)	0.050*** (0.010)	-0.113*** (0.021)	0.143*** (0.004)
	2010	0.004 (0.012)	0.009 (0.012)	0.018 (0.012)	-0.162*** (0.027)	0.122*** (0.006)
Regression Statistics	N. observations	890	890	890	890	886
	Sargan Test (J-statistic)	103.1	102.4	103.5	94.27	101.1
	p-value	0.34	0.31	0.28	0.53	0.36
	First order Autocorrelation	-0.44	-0.45	-0.44	-0.42	-0.45
	p-value	0.00	0.00	0.00	0.00	0.00
	Second order Autocorrelation	-0.14	-0.14	-0.14	-0.13	-0.14
	p-value	0.03	0.05	0.04	0.06	0.02
Standard errors in parenthesis. */**/*** indicate statistical significance at the 10/05/01 level						

Other variables and equations have been tried, but all additional factors have shown low and statistically insignificant coefficients: for example, the effect of interest rates has been tested in different forms such as the discount rate in nuevos pesos, or Tamex in US dollar, or the interaction between Tamex and dollar debt ratio.[50]

The next step is to compare the results related to this period of depreciation with the results of the appreciation (Table 6.2). Equation 1 shows that the changes in the RER still negatively affect investment during this period, but to a lesser extent. This confirms that the balance sheet effect is a dominant factor over the competitive effect: the loss of investment explained by a loss of competitiveness, due to an appreciating currency, has a lower negative impact on investment ratio relatively to a period of depreciation, where the balance sheet effect prevails. However, two significant changes emerge in this second period. Firstly, sales acquire a more predominant role with a relatively higher coefficient confirming the expansionary effect of the commodity boom. Secondly, the coefficient of the lagged leverage ratio switches signs (from positive to negative) showing a negative correlation with investment. This suggests that, during this period, firms tended to cut down their stock of debt. For this reason, solvency presents a low and not significant coefficient as shown in equation 3. Equation 2 shows that, contrary to the previous period, profitability has a higher and significant correlation with investment. Overall, this is a period of higher profits and investments. For this reason, the lagged investment ratio retains its significance, but is less correlated than in the previous period.

Overall, during the commodity boom period, the investment ratio is more correlated to profits, thus the leverage position at the end of the commodity boom period will be fundamental to assess the fragility of the economy (chapter 3). Firms may become more fragile in the case of a collapse of commodity prices if they migrate towards more speculative positions.

Equation 4 still shows a significant positive coefficient once one controls for firms' size. Equation 5 underlines the fact that, in the second period, firms are less sensitive to changes in RER, the interaction term's coefficient is much lower, but still significant.

[50] Tamex: average lending rate in US dollars given by the outstanding commercial loans of the banking system. Source: Superintendentia de Bancos y Segoros, BCRP (2011).

6.3 Business cycle and RER fluctuations

In this section, data on the 117 non-financial firms listed at the Peruvian stock exchange CONASEV will be analysed using the database I have created. This section is divided in three subsections. Firstly, I will analyse the performance of each sector of the economy in terms of investments, profits, US dollar debt and financial ratios. Secondly, given that the RER influences the relationship between tradables and non-tradables, the database is used to analyse the same data grouped by tradables and non-tradables. Finally, I will use the database to analyse the data by type of ownerships categorised in chapter 4.

6.3.1 Analysis by sector

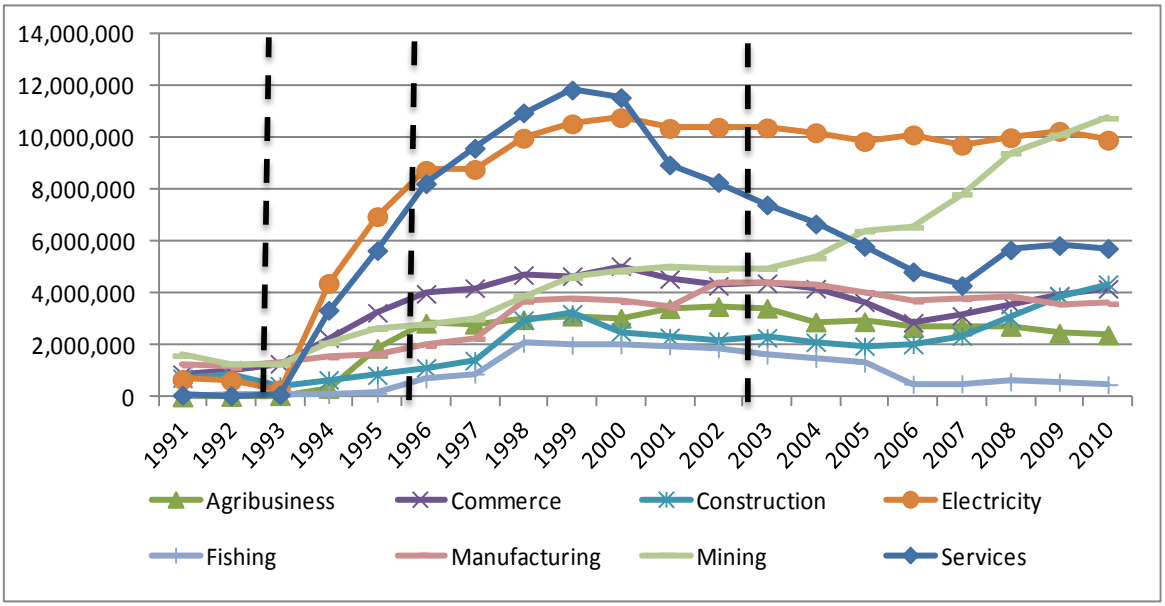
In the following subsections, I will analyse investments, profits, net debt in US dollar and financial ratios during the four RER phases defined previously. For each of these, I will first analyse total values (summing individual firms' values) by sector using micro data from my database, I will then compare these with firms' average values for each sector and, finally, with ratios of total values to GDP.

Investments

First, my database shows that listed firms' investments changed pro-cyclically throughout the period: the first phase (1991-1993, volatile RER) was characterised by investments' stagnation; listed companies increased their investments since privatisation, from 1993 (Phase II, appreciation) until the end of the 1990s (first half of Phase III, depreciation). From the end of the 1990s until the commodity boom, investments decreased. At sectoral level, different tendencies can be teased out: the Services and Electricity sectors stand out for their high levels of investments during Phase II and the first half of Phase III, immediately after privatisation which attracted FDI (see previous chapter). However, investments in the Services sector declined since the recession years of the late 1990s to resume only after the beginning of the commodity boom.

Investments in the Mining sector present an increasing rate of growth which accelerated towards the end of the period. The Construction sector stands out in two moments, at the end of the 1990s and from 2006 onwards. (Figure 6.2)

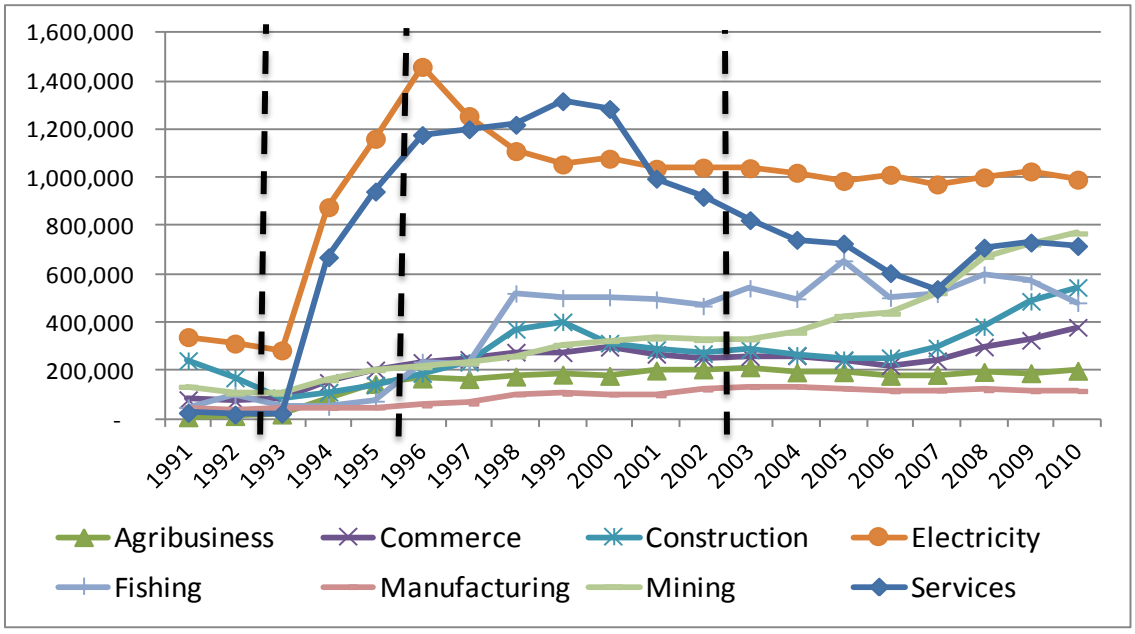
Figure 6.2: Investments by sector (Thousands of nuevos soles) (constant prices base year 2005)



Source: Appendix C

Second, I calculate, within each sector, the average investments by firm: privatised firms, mainly in Services and Electricity sectors, stand out for their highest levels of investments from 1994 to 1999; the high growth rate of investments in the Construction sector during the commodity boom is remarkable; while the rate for the Mining sector appears mitigated. This is consistent with the fact that the Mining sector is over-represented in the sample (Figure 6.3).

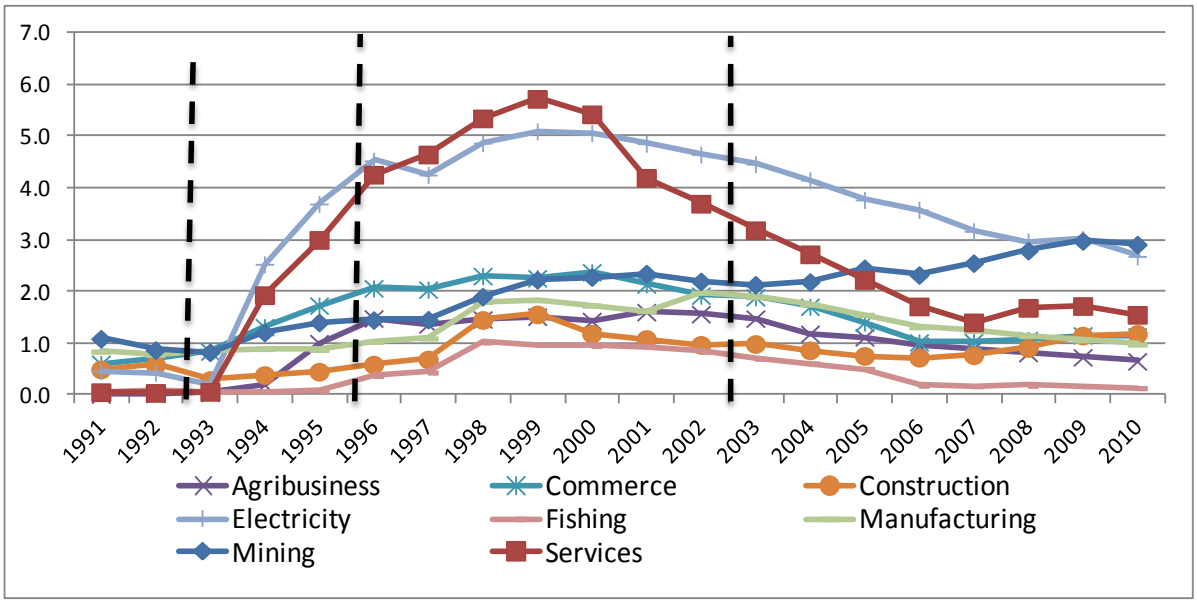
Figure 6.3: Average firm investments by sector (Millions of nuevos soles) (constant prices base year 2005)



Source: Appendix C

Third, the total amount of investments by sector as a percentage of GDP shows a continuous increase of investments in the Services and Electricity sectors in the 1990s and a decline at the beginning of the new century. The commodity sector progressively increased the amount of investments, especially after the commodity boom (Figure 6.4).

Figure 6.4: Investments by sector (Millions of nuevos soles) (percentage of GDP)



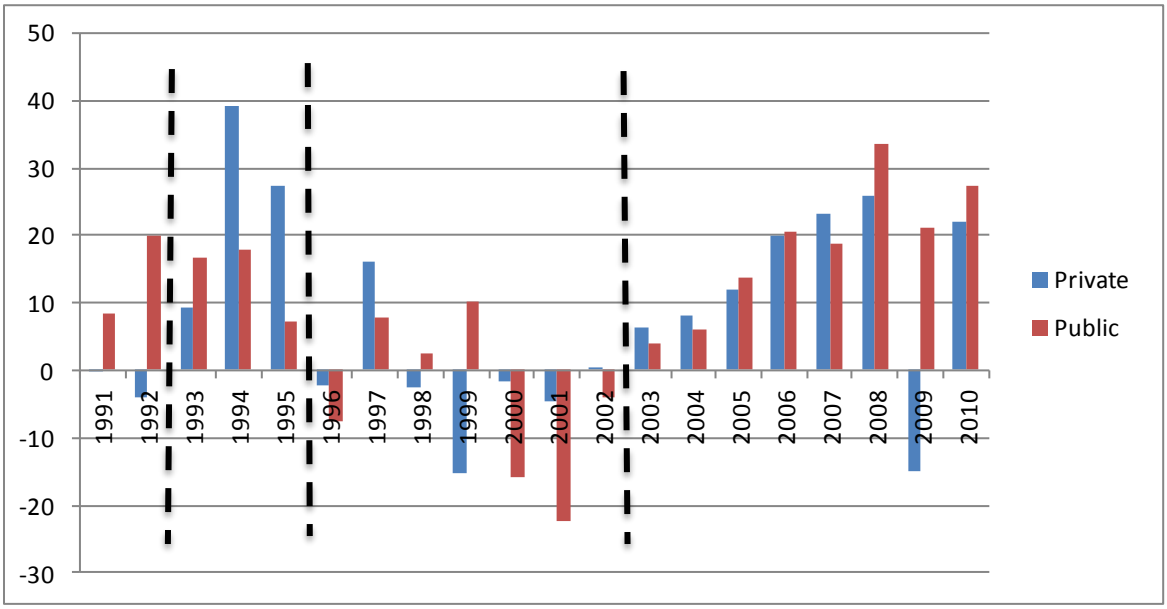
Source: Appendix C

To sum up, my database shows that most of the investments went to the Services (in particular in Telecommunication) and the Electricity sectors after their privatisation in 1994. More specifically, most of the contribution comes from Telefonica del Peru (Telecommunication), Edegel and Edenor (Electricity). There was also a rapid increase in the Constructions/Real Estate Sector and the Mining sector during the years of high growth after 2005. As expected, the commodity price boom had a positive effect on the Mining sector; finally, investments in Manufacturing lagged behind.

In order to verify the reliability of my database, I implement a triangulation with central bank data on aggregate fixed investments and the government agency Proinversión sectoral data on foreign direct investments: my database is consistent with both sources. As shown in the figure below (Figure 6.5), since 1991, there have been two investment booms (1994-95 period, 2006-2008 period) and two periods of low investment, because of the international financial

crises and the political turmoil during 1998-2002 period, and the blip during the Great Recession in 2009.[51]

Figure 6.5: Yearly growth rate of gross fixed investment at aggregate level (percentage)



Source: BCRP (2011)

However, the BCRP does not provide data by sectors. The only government agency which provides some indications on FDI is Proinversión which gathers data on a voluntary basis. Hence, data is not complete as only firms which want to publicise their brand and declare how much they are investing pass their data to Proinversión. Data gathered by sector show consistency with the database which I created in terms of investment connected to the privatised firms. Table 6.3 shows that Proinversión recorded large flows of investment in the Communication sector in 1994 and in 2000; the Energy sector attracted capital inflows from

[51] Aggregate data for investment is consistent with data shown in Figure 6.4, with the provision that the Service sector experienced a spectacular growth especially in 1994 (because of privatisation) and the Fishing sector experienced *el niño.*

1994 to 1999; during the commodity boom, the Mining, Construction and Housing sectors benefited from FDI.

Table 6.3: FDI by sector (Millions of US$) (1991-2009)

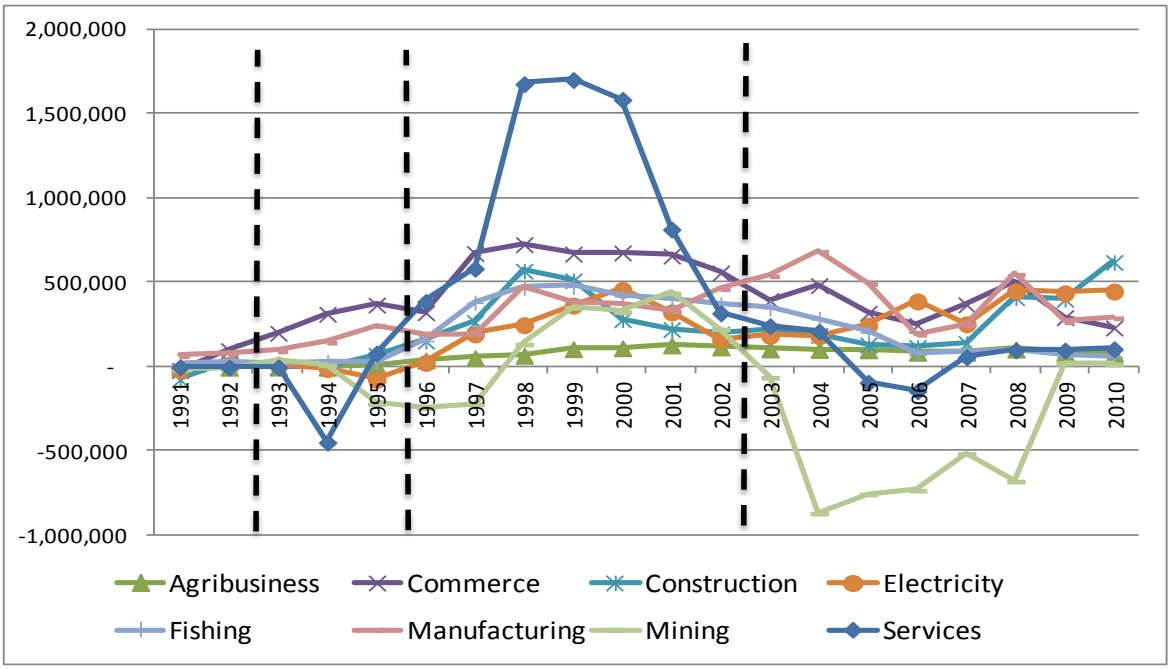
SECTOR	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	TOTAL
AGRIBUSINESS	-	0.6	-	-	2.8	-0.5	0.5	18.5	15.9	2.3	-	-	-	-	-	0.0	-	0.3	-	40.5
COMMERCE	8.4	4.4	14.8	29.0	8.8	118.6	70.0	106.1	11.1	38.0	21.2	-1.3	0.4	21.6	-2.0	36.0	9.1	15.3	30.1	539.7
COMMUNICATION	-	-	0.1	2,003.0	1.9	1.6	18.1	73.9	255.4	2,233.5	-220.7	302.5	28.1	-387.1	-622.4	-8.2	67.7	-100.4	28.1	3,675.0
CONSTRUCTION	0.1	0.3	1.3	0.8	9.9	16.2	1.9	11.9	11.4	4.4	10.4	-	10.0	2.7	9.1	26.0	36.9	23.9	12.6	189.9
ENERGY	-	2.6	0.2	361.4	-	374.2	528.8	106.4	166.4	-3.5	88.6	0.7	5.8	15.7	-	16.5	8.8	839.5	90.8	2,602.7
FINANCE	4.2	22.9	56.7	43.7	266.7	188.1	105.2	131.3	585.2	258.1	487.6	-194.1	-147.5	57.3	332.8	198.3	65.9	189.0	118.7	2,770.1
MANUFACTURING	10.3	9.8	49.9	52.3	140.7	329.2	205.4	130.9	133.2	70.5	162.3	712.9	24.9	-81.6	-77.7	433.4	10.9	101.3	1.0	2,419.5
MINING	8.7	119.3	8.9	310.3	202.7	129.6	116.7	174.9	320.2	34.9	5.1	3.1	0.9	239.9	278.2	616.1	66.3	456.2	443.0	3,534.9
FISHING	-0.1	-	1.0	0.5	-	0.8	-	-	-	-	-	-	-	4.5	4.5	118.5	30.0	-	-	159.7
OIL	0.0	0.0	0.1	0.1	1.8	33.6	3.4	0.0	-	-	60.0	50.0	-	-	-	-	0.3	148.0	-	297.4
SERVICES	1.1	0.3	0.4	1.8	3.2	12.7	15.9	24.5	34.7	23.2	147.3	46.4	17.1	6.8	11.7	10.7	25.0	24.1	40.9	447.9
TRANSPORT	0.2	-0.5	3.4	0.4	1.4	0.3	6.3	64.7	-64.8	11.0	12.9	92.7	113.4	1.6	-	-	-	40.0	6.9	290.0
TURISM	-	2.1	0.0	6.2	7.0	10.0	0.6	5.6	16.6	-	-	-	3.7	-	1.1	0.1	0.2	0.3	0.5	54.0
HOUSING	0.0	-	1.0	0.2	0.3	0.1	3.2	0.4	2.3	0.2	10.6	-0.7	0.4	1.1	0.3	0.6	-	500.1	-	520.1
TOTAL	32.9	161.8	137.9	2,809.5	647.4	1,214.5	1,076.0	849.1	1,487.7	2,672.5	785.4	1,012.2	57.2	-117.6	-64.3	1,448.0	321.1	2,237.7	772.6	17,541.6

Source: Proinversión

Net debt US Dollar Balance (US dollar debt-US dollar assets)

First, my database shows that the net dollar debt stock started to increase significantly only during Phase II for Commerce and Manufacturing sectors and continued to rise during Phase III spreading to all sectors in a pro-cyclical pattern. However, the generalised increase of external liabilities contributed to the halt of the economy at the end of the 1990s, because of the effect of depreciation on firms' balance sheets (Section 6.2; Carranza et al., 2003; Saldaña and Velasquez, 2007). The Service sector stands out as the most indebted at the end of the 1990s. Companies' balance sheets were then cleaned in terms of external debt from 1999 until 2007, when a new cycle of indebtness started: this new cycle was particularly evident for the Construction sector; on the contrary, the Mining sector adopted a counter-cyclical behaviour by accumulating dollar cash (assets) since the beginning of the commodity boom in 2003, this was then used up in 2009 when financing conditions were tight (Figure 6.6).

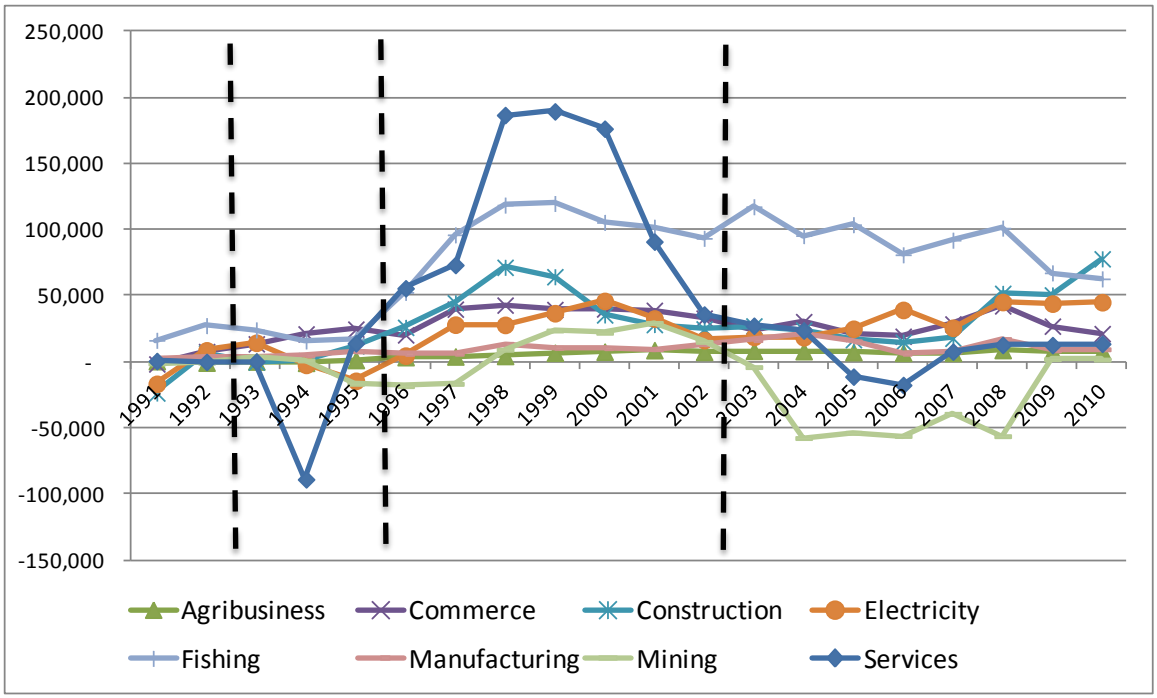
Figure 6.6: Net US dollar balance by sector (Thousands US$) (constant prices base year 2005)



Source: Appendix C

Second, in terms of averages by sector, the Telecommunication is dominant as in the previous figure, while the Construction sector is the most exposed in terms of dollar debt after the commodity boom. This would prove that real estates, as assets close to the financial ones (Toporowski, 2010), tend to build-up its fragility through leverage during boom years: when growth resumed in 2010, dollar debt of the Construction sector increased further. Finally, the level of dollar indebtness increased since 2007 for all sectors (Figure 6.7).

Figure 6.7: Average firm net US dollar balance by sector (Thousands of US$) (constant prices base year 2005)



Source: Appendix C

To sum up, my database identifies two periods of increasing dollar indebtedness. The first period corresponds to Phase II and first part of Phase III in which foreign capital entered the country attracted by the privatisation of state enterprises. The second period is during the second half of Phase IV and is characterised by large capital inflows and high revenues from the commodity boom. The accumulation of dollar debt stocks raises concerns in case of commodity prices decline and consequent depreciation of the domestic currency.

In terms of consistency of data, and as a proof based on the triangulation method, these results are in line with the aggregate indebtness of the private sector, as shown in Figure 6.8.

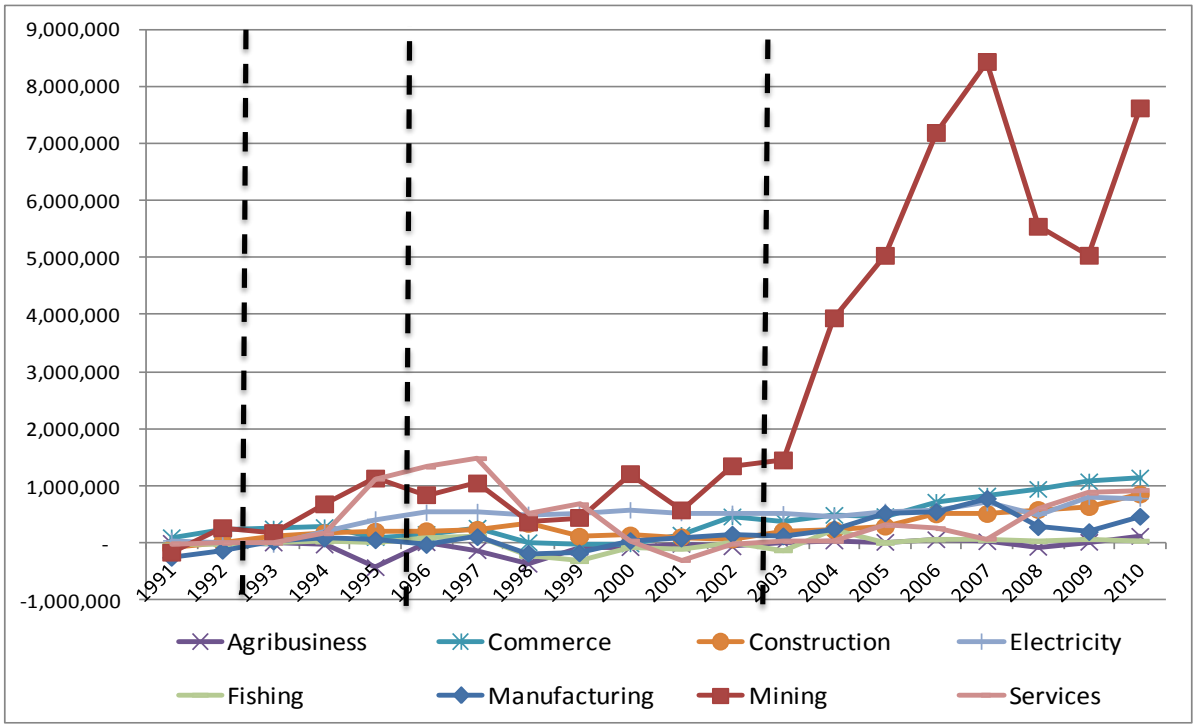
Figure 6.8: Private non-guaranteed external debt stock (Millions of US$) (1991-2009)

Source: World Development Finance (2011)

Net Profits

The database shows that the Mining sector appears dominant throughout the entire period: Figure 6.9 below shows its relative size compared to other sectors. Even considering the average by sectors, the Mining sector has the largest profits. However, this may be emphasised by the over-representation of the sector in the database (Section 4.3.2).

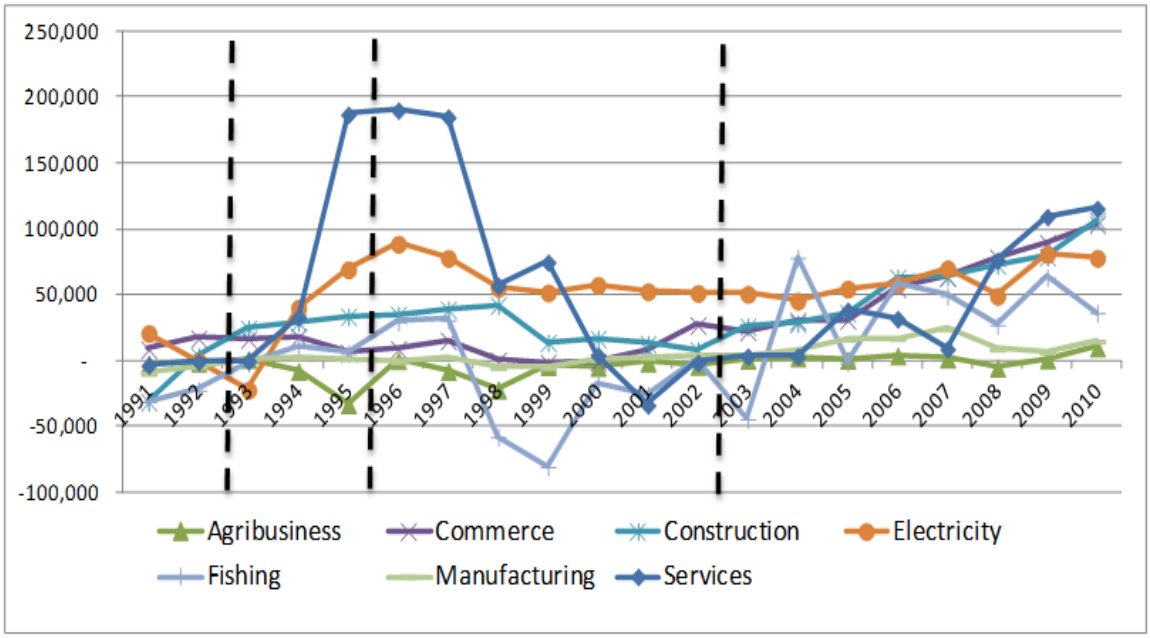
Figure 6.9: Net profit by sector (Thousands of nuevos soles) (constant prices base year 2005)



Source: Appendix C

In terms of averages, the Services, Construction and Fishing sectors appear to be the most cyclical; the Commerce sector benefits particularly form the commodity boom; the Electricity sector maintains its level of profits since the post-privatisation years; Manufacturing and Agribusiness remain constant at a low level for the whole period (Figure 6.10).

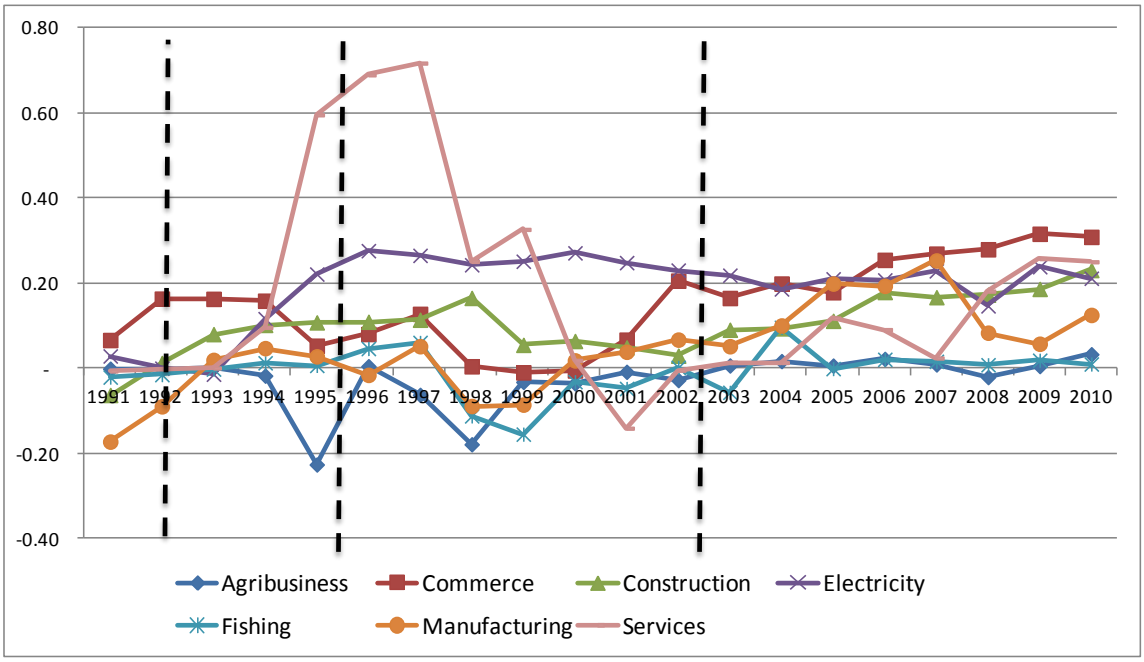
Figure 6.10: Average firm net profits by sector excluding Mining sector (Thousands of nuevos soles) (constant prices base year 2005)



Source: Appendix C

Finally, by observing total profits for each sector in relation to the business cycle (Figure 6.11), the Service sector appears to be the most volatile. The Electricity sector maintains its level of profit after the first period post-privatisation; during Phase IV, Construction and Commerce increase their profits, while Manufacturing lags behind with the exception of a couple of years at the beginning of the commodity boom.

Figure 6.11: Net profits by sector excluding Mining sector (percentage of GDP)



Source: Appendix C

Ratios by sector

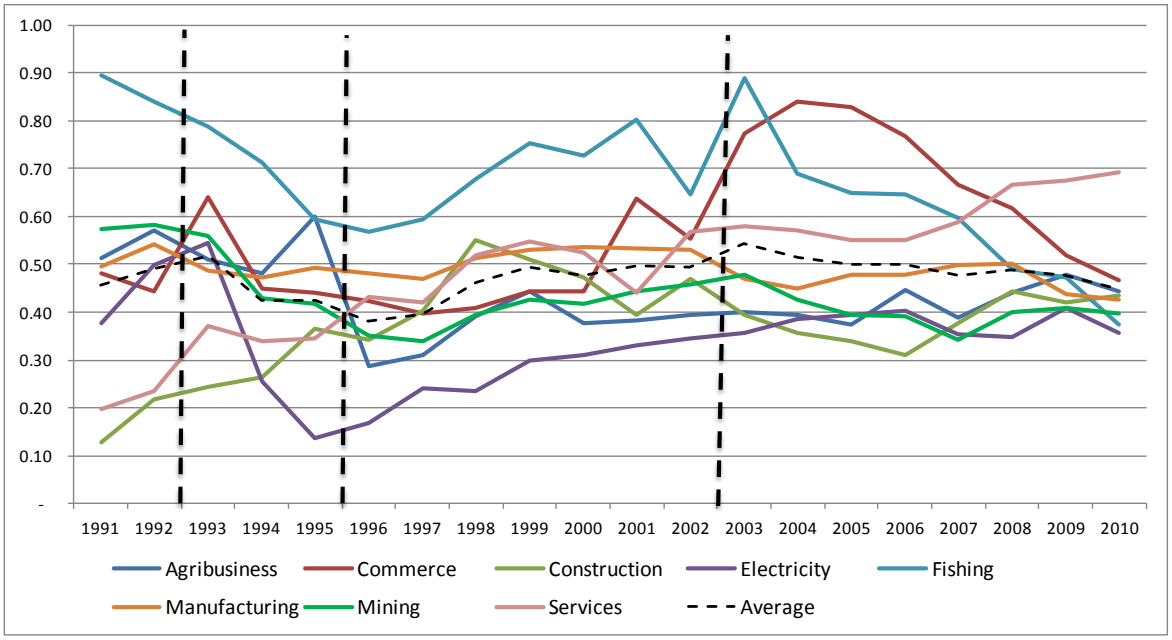
In this sub-section, I analyse the financial ratios, leverage, liquidity, return on assets (ROA) and solvency, in terms of firms 'average by sectors.

Leverage ratio (Total Liabilities/ Total Asset)

The leverage ratio confirms the macro picture displaying a pro-cyclical pattern with an average deterioration from 1996 until 2003, and a subsequent improvement at the beginning of the commodity boom. It increased during Phase III when firms accumulated more dollar debt, and decreased during Phase IV.

In terms of sectoral analysis, Service and Electricity sectors show an increasing leverage ratio. The Fishing sector remains significantly leveraged especially up to 2003 when, after *el niño*, it manages to converge to the average. The Construction sector also shows a pick of the leverage ratio in 1998 and then an increase in the last four years (Figure 6.12).

Figure 6.12: Leverage ratio by sector

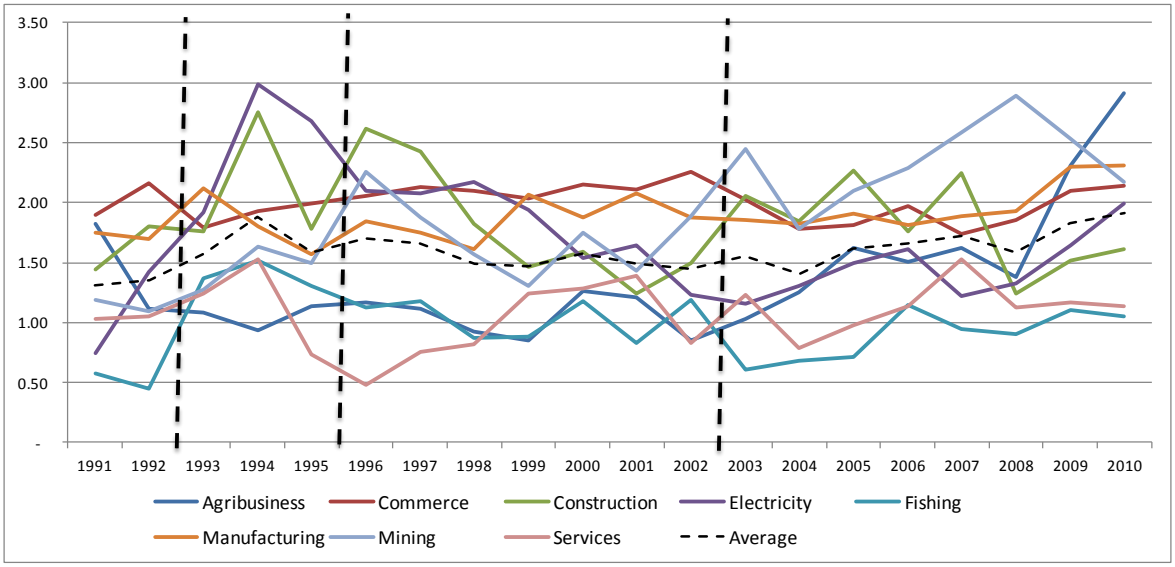


Source: Appendix C

Liquidity ratio (Current ratio = Current Asset/Current Liabilities)

In terms of liquidity, the Fishing sector confirms to be the weakest one, followed by the Service and the Agribusiness sectors. The latter considerably improves with the commodity boom while the Construction sector deteriorates significantly during the same period. Also in this case, the general pattern is still pro-cyclical; the liquidity ratio decreases from mid 1990s to the beginning of the commodity boom when it improves (Figure 6.13).

Figure 6.13: Liquidity ratio by sector

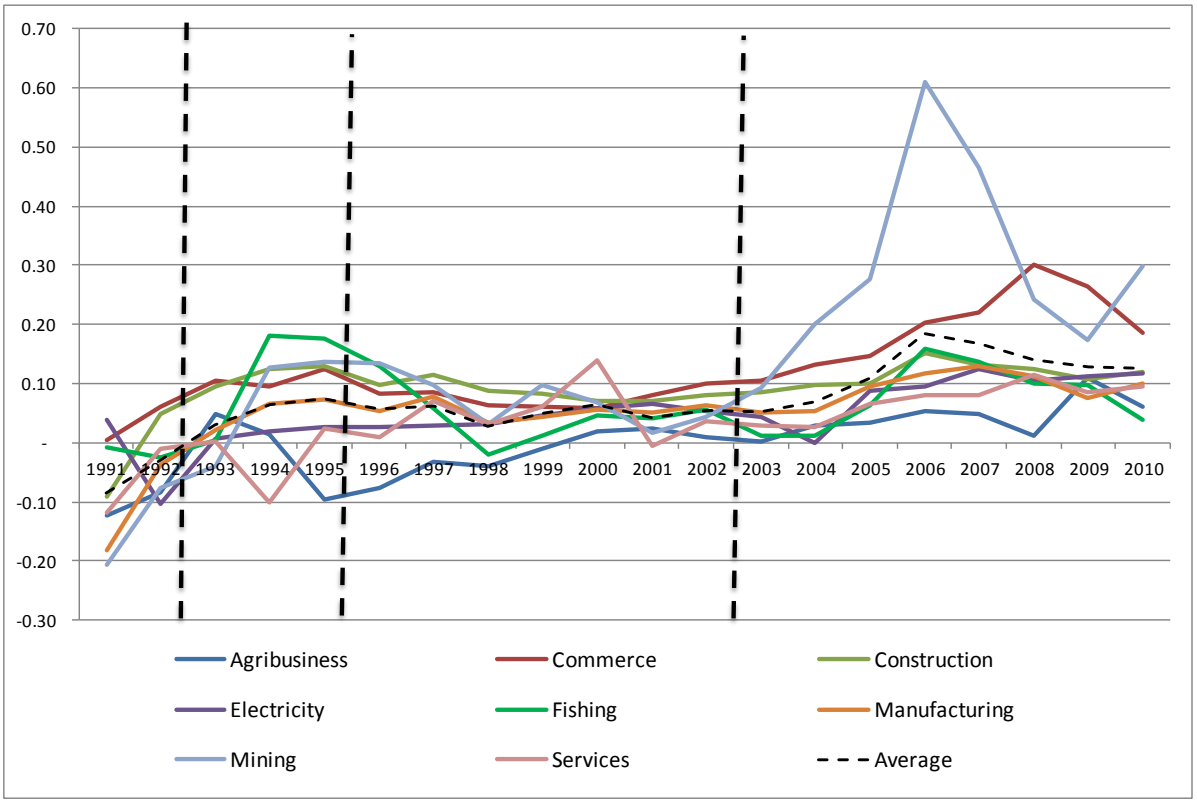


Source: Appendix C

ROA ratio (Operating Profit/ Total Assets)

The profitability, measured as ROA, displays a pro-cyclical pattern. Mining and Commerce sectors show an above average profitability; the Fishing sector retains its typical volatility and, finally, the Agribusiness is the worst performer (Figure 6.14).

Figure 6.14: Return on assets

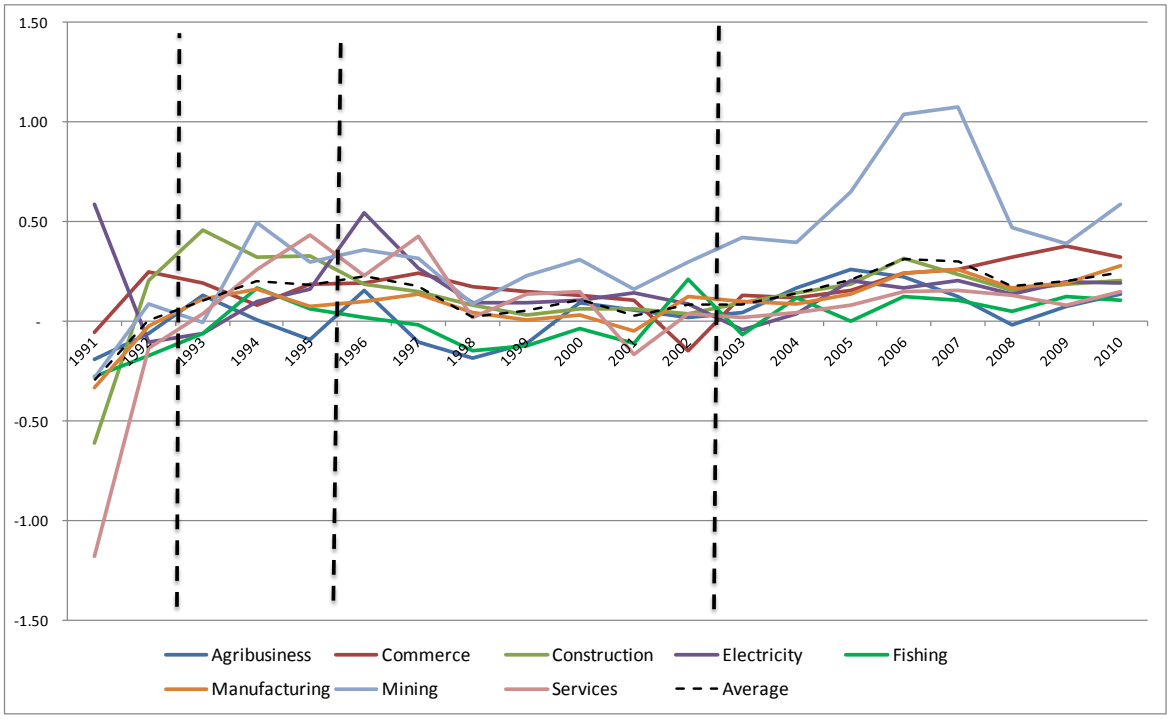


Source: Appendix C

Solvency ratio (Net Profit/Total Debt)

The solvency ratio shows a similar pro-cyclical pattern: a decrease can be observed from mid 1990s until the beginning of the commodity boom: the Mining sector has the best profile; the Fishing and Agribusiness sectors have the worst ratios during the recession period at the end of Phase III, and remain almost unchanged until the end of the period; the Construction sector shows a deteriorating ratio from Phase II to Phase III, it improves at the beginning of Phase IV, but its accumulation of debt in the second half of the period has a negative effect on the ratio (Figure 6.15).

Figure 6.15: Solvency ratio by sector



Source: Appendix C

Summary of findings

This section discusses the above empirical findings by sectors in relation to the growth of the economy and the evolution of the RER across its four phases.

First, the Mining sector shows a resilient capacity to invest throughout the period. However, there is a distinction between the first three phases of RER and the fourth one characterised by the commodity boom. Before Phase IV, the Mining sector, similarly to other sectors, accumulated US dollar debt to finance its expenditure during a period of lower profitability. However, during Phase IV, the abundance of profits, confirmed by the improvement of liquidity and ROA ratios, allowed for an accumulation of US dollar assets which formed a cushion against the recent shock.

Second, the Service and the Electricity sectors show common characteristics: these sectors were privatised, mainly during Phase II, and, residually, during Phase III. Their increasing indebtedness can be explained by the fact that state companies were privatised with clean balance sheets; this (subsidised) acquisition of large assets stimulated a new cycle of indebtedness. Investments seem to be driven by the FDI which were attracted by privatisation. Investments declined during Phase IV when the FDI flows were directed towards other sectors, especially Mining. As a result, the leverage ratio deteriorated throughout the two decades because of debt accumulation until Phase IV, and because of asset deterioration due to lack of investments in Phase IV. During the last phase, the liquidity ratio improved, but profitability remained below the economy's average. Furthermore, both sectors showed pro-cyclicality in terms of profits. The Electricity sector's development was stable during the business cycle, while the Service sector showed a higher volatility.

Third, the Commerce sector followed a similar pro-cyclical pattern. It benefitted from the FDI flows during Phase II as shown by the increase of investments and profits. However, the level of indebtness, shown by the leverage ratio, increased during Phase II and III, and remained unchanged until 2010. During Phase IV the sector benefited from the boom and showed high profits and return on asset leading to an improvement in solvency. Typical of this sector's operational characteristics, liquidity was high and remained stable throughout the two decades.

Fourth, interesting dynamics are noticed for the Construction sector. This is the sector which showed the highest volatility in terms of investments and profits during the business cycle. Leverage increased during boom periods thanks to the access to the US dollar debt market. However, the sector is characterised by a high risk, indicated by the volatility of the financial ratios, and by a persistent high return on asset ratio.

Fifth, the Manufacturing sector showed a certain struggle during the 1990s with low investments and low profits throughout the entire period with the exception of a couple of years during Phase IV. The analysis of financial ratios, however, does not indicate immediate concerns for its survival: leverage, profitability and solvency are in line with the economy and the sector is very liquid. However, given its strategic importance in terms of structure of production, the Manufacturing sector will be further analysed in more depth in the final section.

Sixth, the Fishing industry shows a volatile profile due to the seasonality of *el niño*, but it also tracks the business cycle in terms of investments and profits. The sector started from a position of high indebtness, as shown by the leverage ratio, and increased the US debt during Phase III in a volatile pattern. However, during Phase IV, it managed to reduce its level of indebtness. Overall, observing both the insolvency and liquidity ratios, the sector struggled throughout.

Finally, the Agribusiness appears to be the sector with the worst profile. Investments only improved in 1990s with some FDI, but the sector remained with the lowest profits and returns. Given the low profitability, because of its lack of access to the credit market, it showed very low levels of US dollar debt; it has the worst solvency ratio.

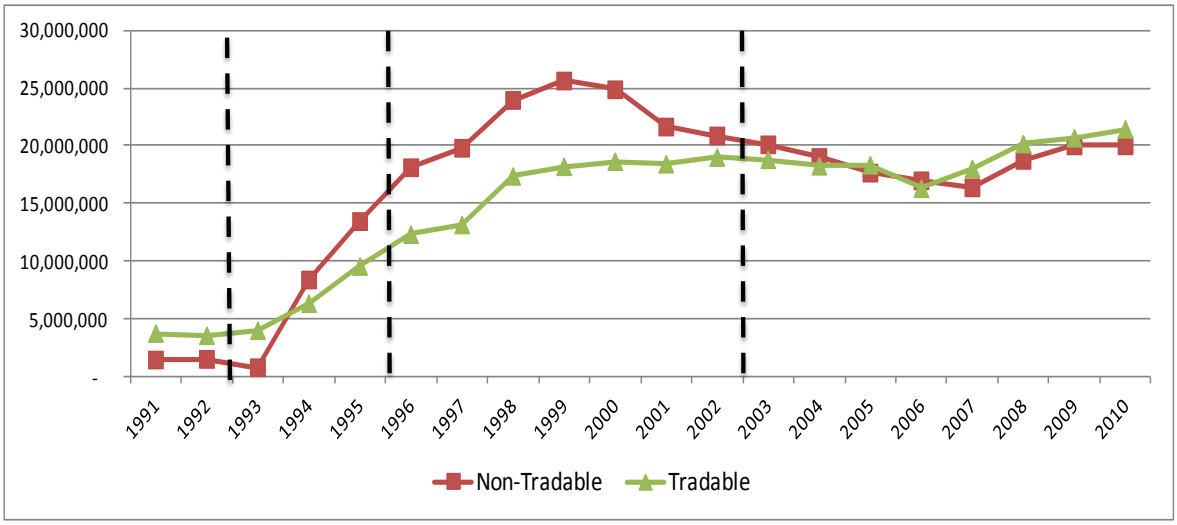
6.3.2 Analysis by tradables and non-tradables

The above sector analysis leads to the tradable and non-tradable classification: the non-tradable sector is composed by sum of the Construction, Electricity and Service Sectors, that means a total number of 27 firms. The tradable sector is composed by all the remaining sectors for a total number of 90 firms. In the next sub-sections the same variables analysed in the previous section will be considered and additional findings will arise from different categorisations, as anticipated in chapter 4.

Investments

The simple aggregation of absolute values shows that investments in the two sectors are strongly correlated and follow a pro-cyclical path. Investments increase during Phase II and Phase III and then decline from the recession of the late 1990s until 2007 (Figure 6.16).

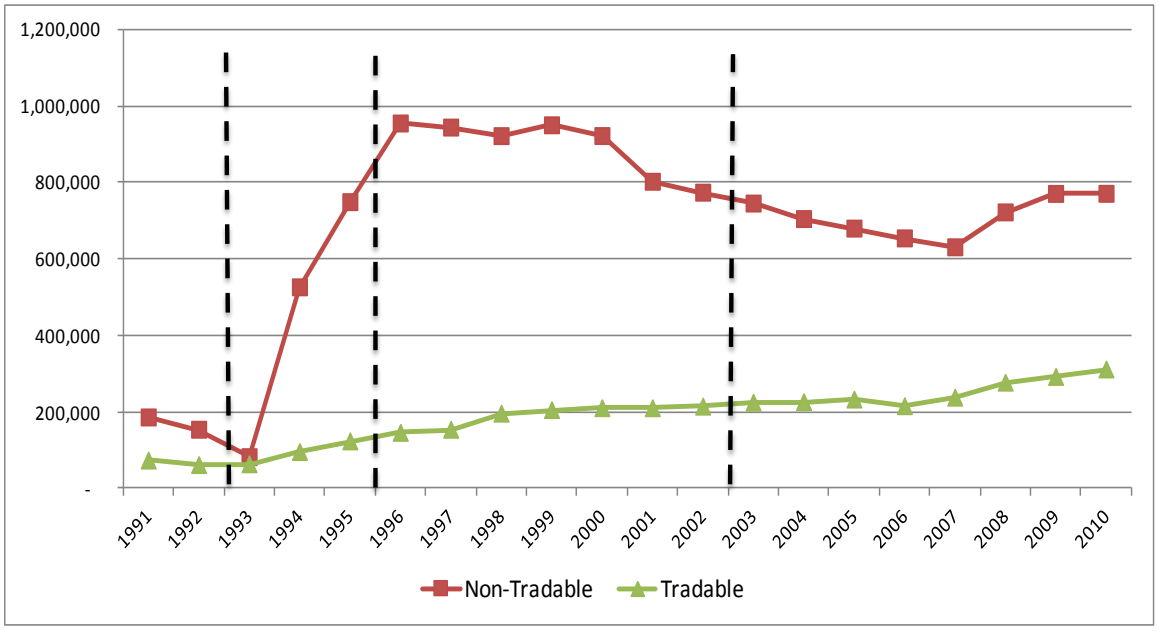
Figure: 6.16 Investments by tradable and non-tradable (Thousands of nuevos soles) (constant prices base year 2005)



Source: Appendix C

When total values are divided by the number of firms in each sector, then the difference between tradables and non-tradables is even more evident (Figure 6.17).

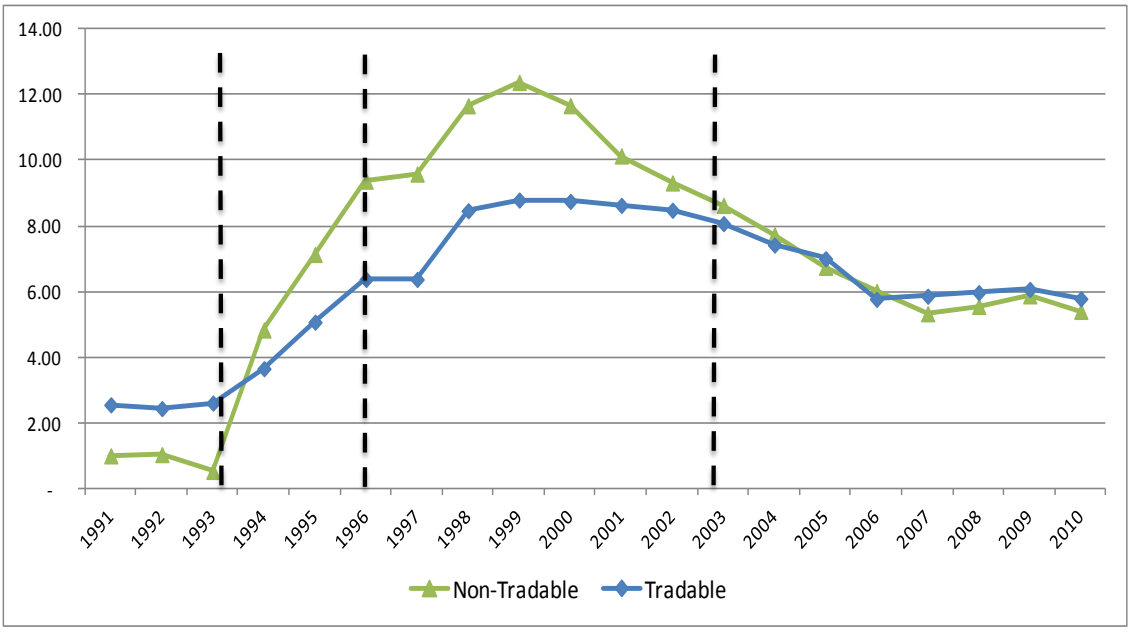
Figure 6.17: Average investments by tradable and non tradable (Millions of nuevos soles) (constant prices base year 2005)



Source: Appendix C

Finally, in relation to the business cycle, the tradable sector is less volatile. Furthermore, it appears that there is some lag in relation to the RER Phases; despite the depreciation in Phase III, investments continue to increase (until 1999 for the non-tradable sector, until 1998 for the tradable sector) even when the economy shows no signs of growth and credit growth is declining. Finally, investments stabilise in relation to GDP only after three years of economic boom during Phase IV (Figure 6.18).

Figure: 6.18 Investments by tradable and non-tradable (percentage of GDP)

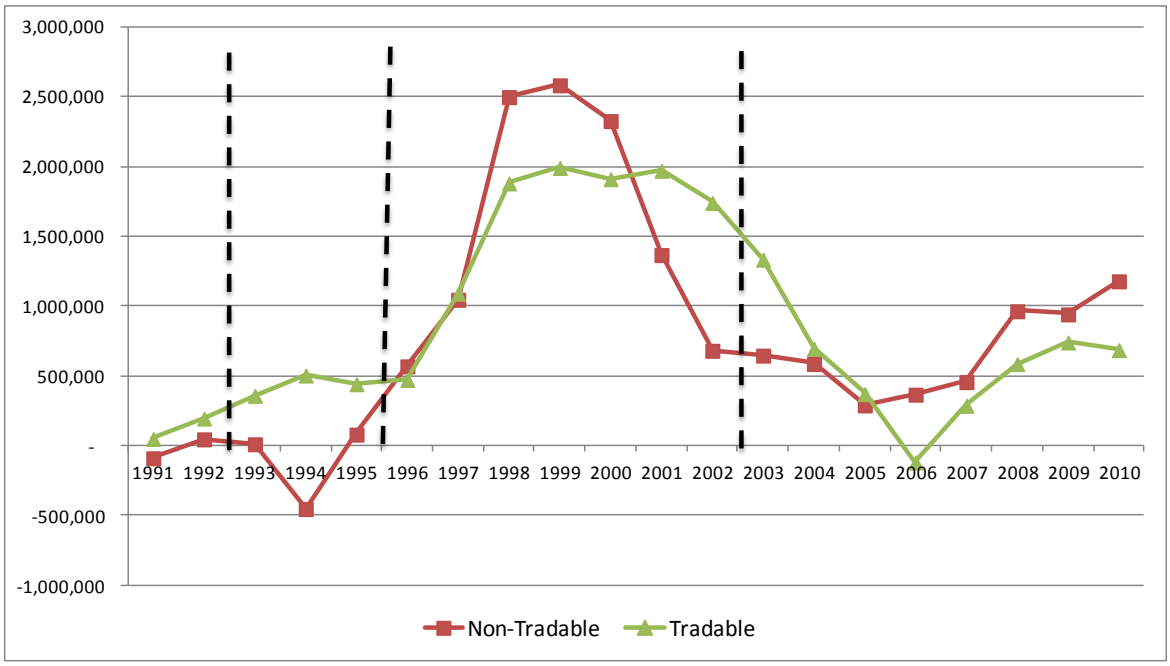


Source: Appendix C

Net Dollar Balance

Similarly to investments, dollar balances show a pro-cyclical nature. It appears that the Service and Electricity sectors contribute to make the non-tradable sector relatively more volatile and more indebted than the tradable sector (Figure 6.19).

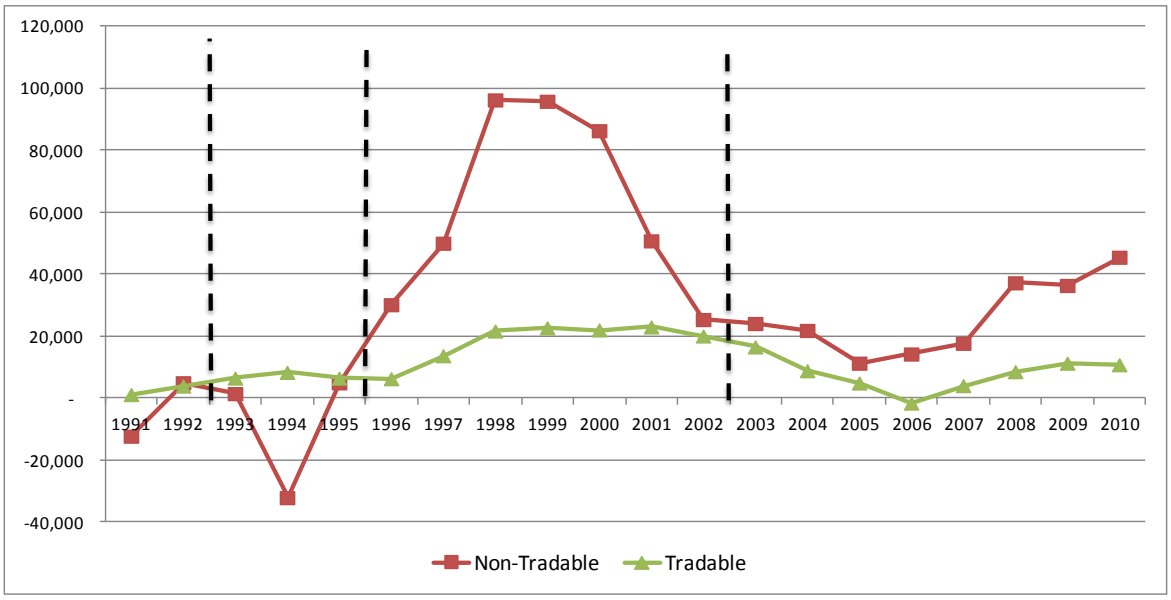
Figure: 6.19 Net US Dollar debt balance by tradable and non-tradable (Thousands of US$) (constant prices base year 2005)



Source: Appendix C

However, the sample is formed by a higher number of tradable firms, thus the picture changes once the average indebtness by firm is calculated. The average dollar indebtness is much higher for the non-tradable sector as shown in Figure 6.20 below. These findings confirm that the non-tradable sector is the one which benefits more by a stabilising exchange rate policy.

Figure: 6.20 Average net US Dollar debt balance by tradable and non-tradable (Thousands of US$) (constant prices base year 2005)

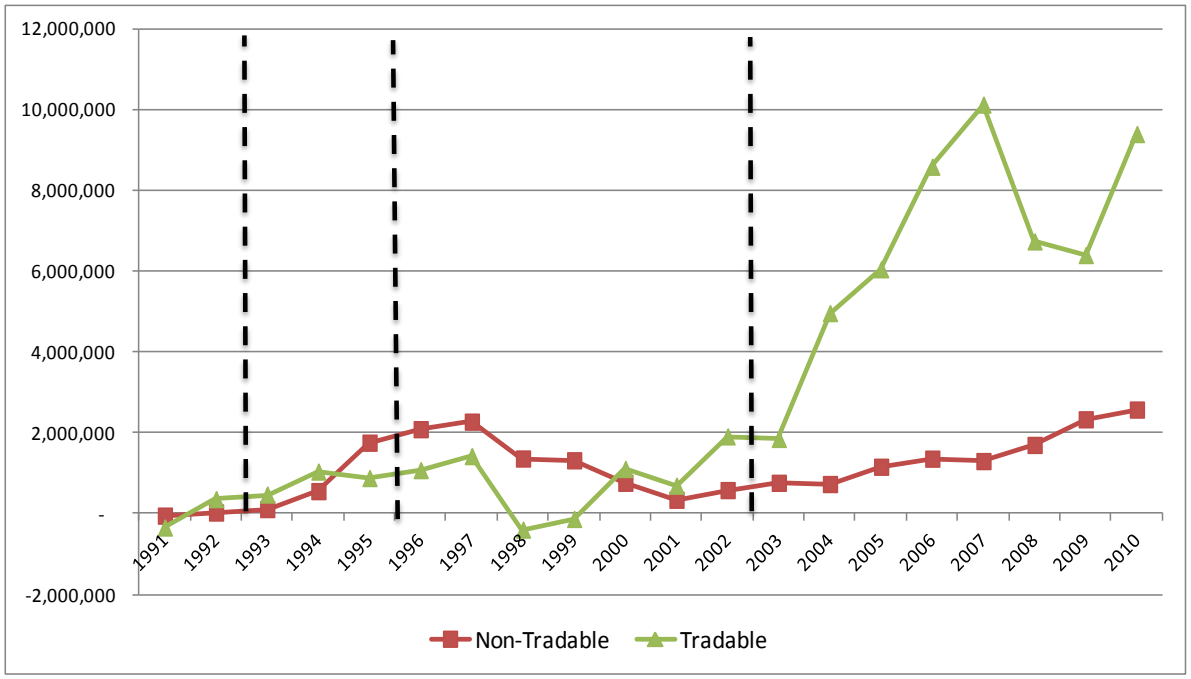


Source: Appendix C

Net Profits

The pro-cyclicality of profits observed in the previous section and the extraordinary profits of the Mining sector induced by the commodity boom is confirmed here (Figure 6.21).

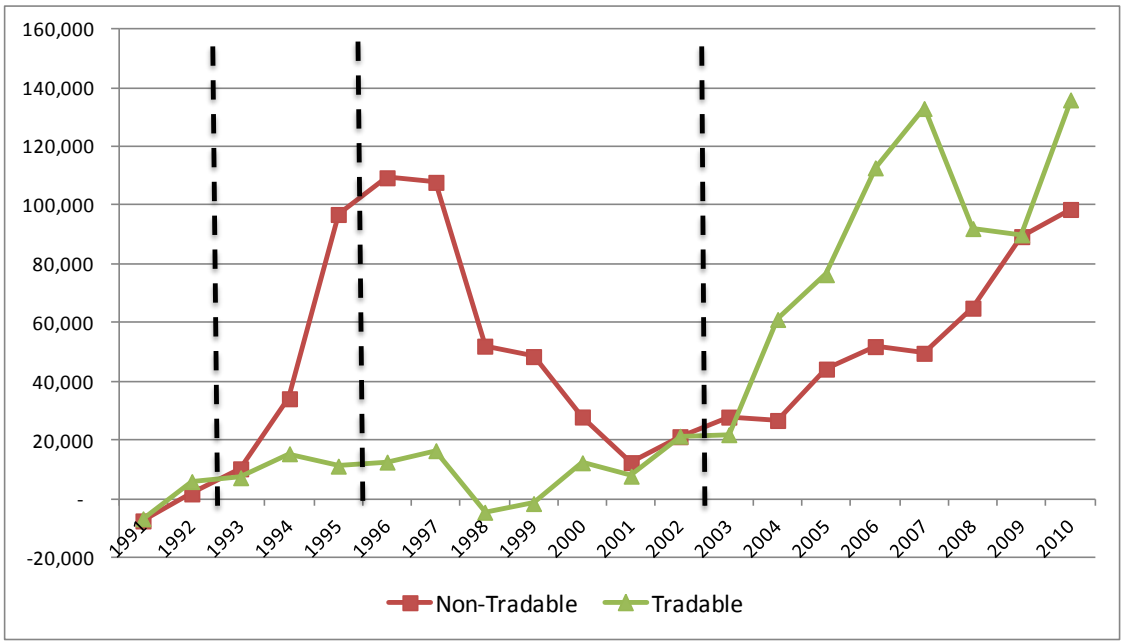
Figure: 6.21 Net profits by sector (Thousands of nuevos soles) (constant prices base year 2005)



Source: Appendix C

Two issues can be teased out from the observation of the average values of net profit by firm. Firstly, during the 1990s the non-tradable sector shows volatile profits: these are increasing after privatisation and rapidly decreasing in the late 1990s. This trend is similar to that of the dollar indebtness, but it precedes it. Secondly, during the commodity boom the tradable sector lifts the profits of the non-tradable sector which increase significantly only after 2007 (Figure 6.22).

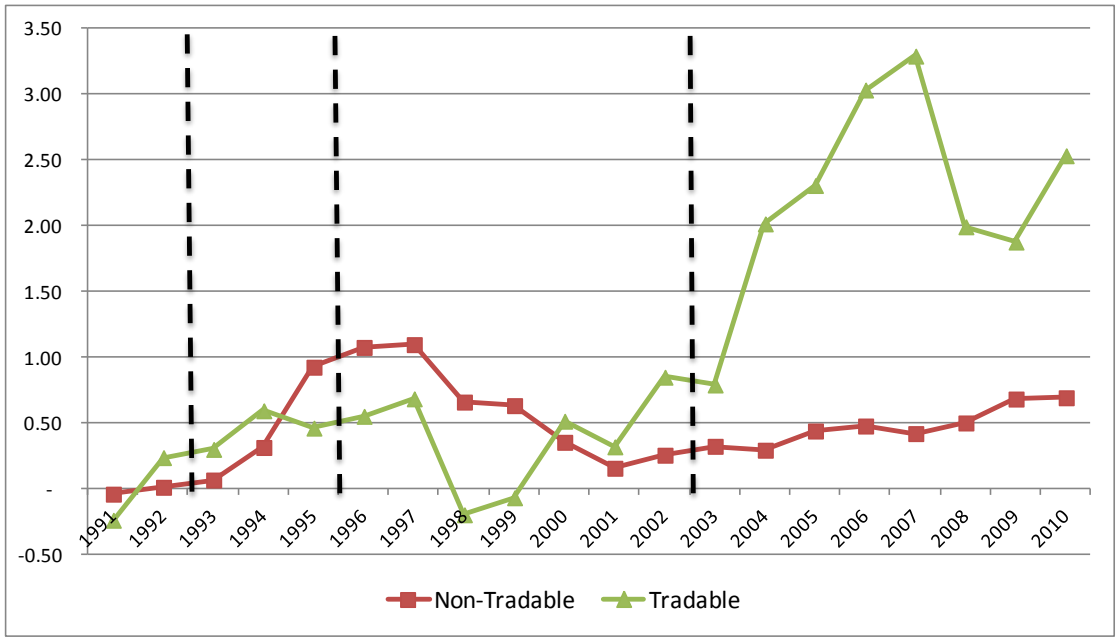
Figure: 6.22 Average net profits by tradable and non-tradable (Thousands of nuevos soles) (constant prices base year 2005)



Source: Appendix C

With respect to the business cycle, the non-tradable sector experiences a rapid increase of net profits during Phase II and the beginning of Phase III; the recession has then an impact on the tradable sector in 1998 and 1999, which, eventually experiences extraordinary profits during Phase IV (Figure 6.23).

Figure 6.23: Net profits by sector (percentage of GDP)



Source: Appendix C

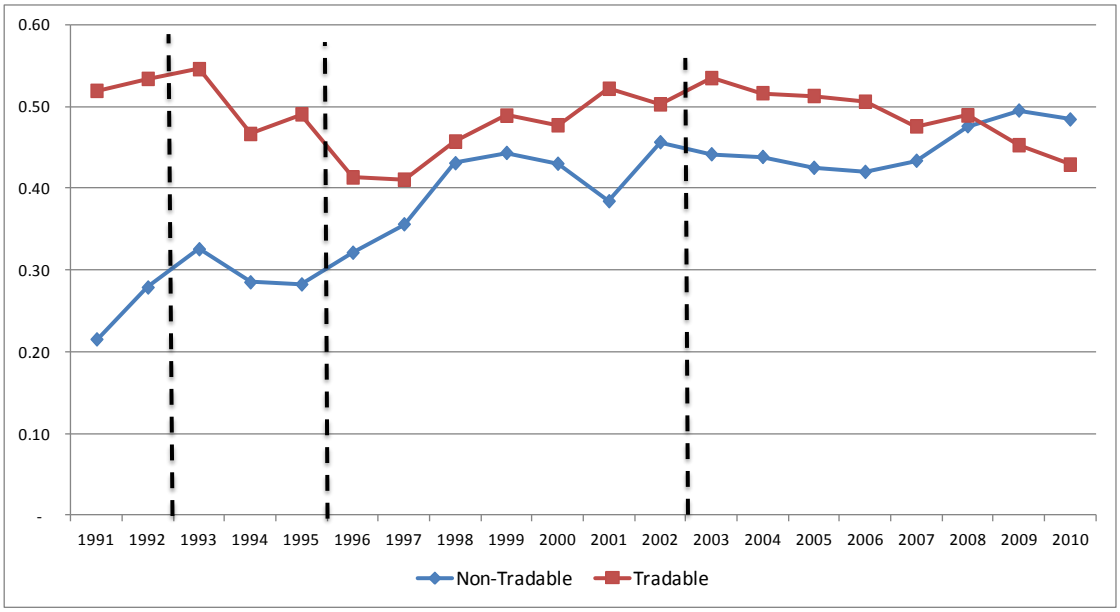
Financial ratios

This sub-section analyses firms' average financial ratios by tradable and non-tradable sectors.

Leverage ratio (Total Liabilities/ Total Asset)

The leverage ratio of the tradable sector shows a cyclical behaviour with an improvement during the periods of growth and exchange rate appreciation (Phase II and IV of RER) and a deterioration during the period of depreciation (Phase III). On the contrary, the non-tradable sector shows a continuous increase in leverage especially during the beginning of Phase III and in the last part of Phase IV (Figure 6.24).

Figure 6.24: Leverage ratio by tradable and non-tradable

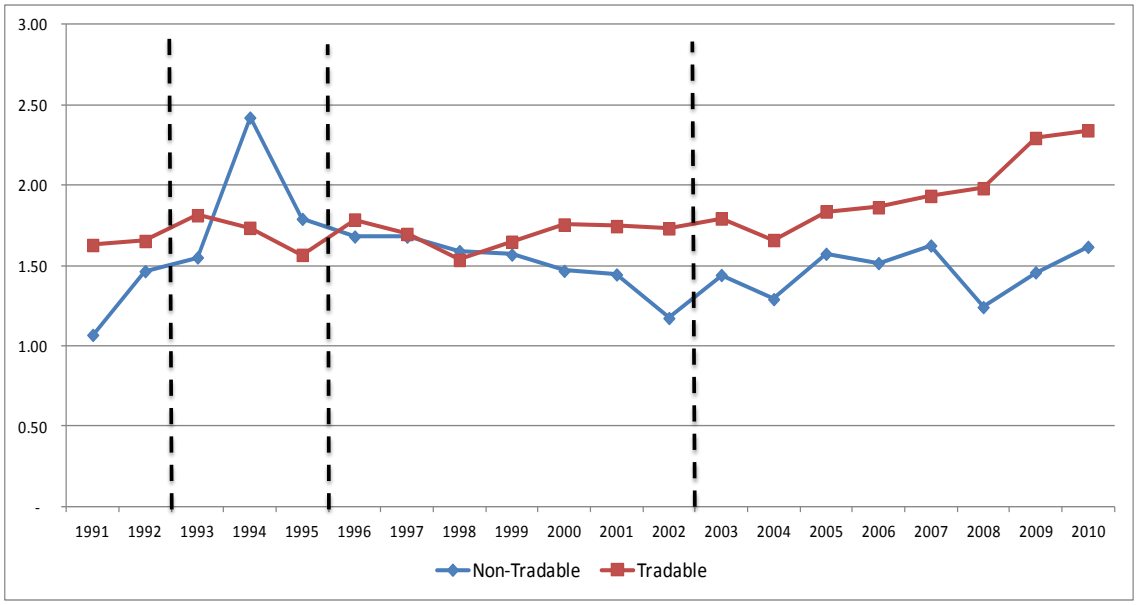


Source: Appendix C

Liquidity ratio (Current ratio = Current Asset/Current Liabilities)

The liquidity ratios show a bifurcation between the two sectors. The liquidity of the non-tradable sector deteriorates since Phase II, and mildly improves during Phase IV. The liquidity of the tradable sector remains almost constant throughout the whole period improving significantly during the commodity boom period (Figure 6.25).

Figure 6.25: Liquidity ratio by sector

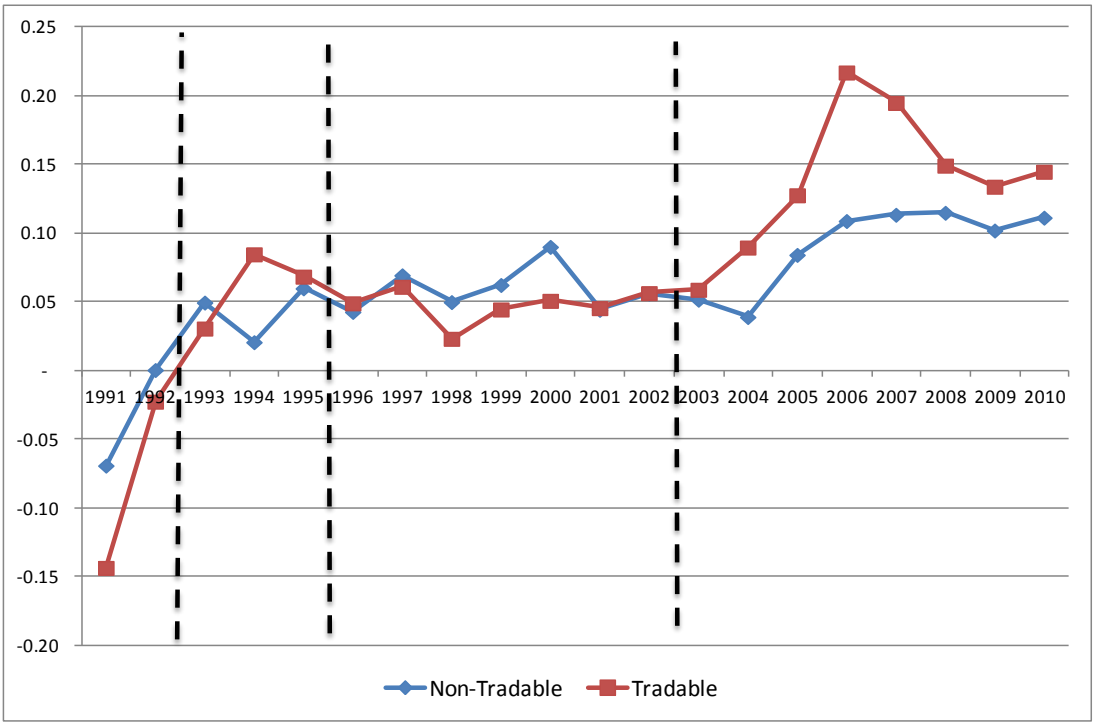


Source: Appendix C

ROA ratio (Operating Profit/ Total Assets)

The profitability ratios improve in two periods for both sectors, during Phase I and II, and during the commodity boom in Phase IV. Driven by the Mining sector, the tradable sector shows a higher profitability during phase IV. During Phase III the profitability remains unchanged for both sectors (Figure 6.26).

Figure 6.26: Return on assets

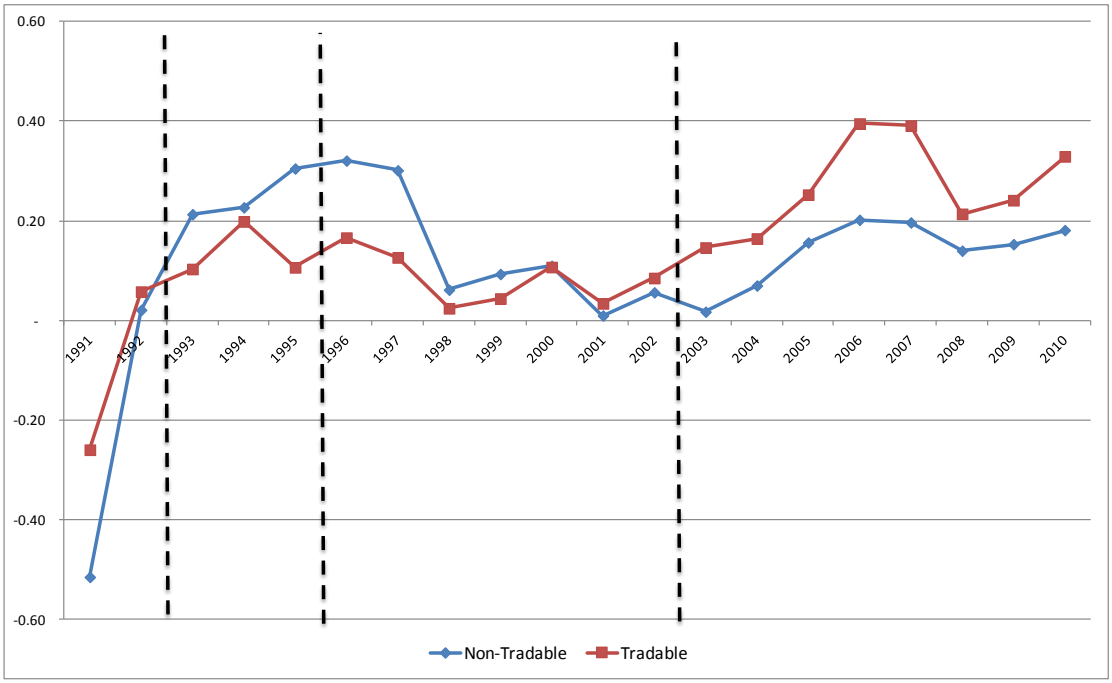


Source: Appendix C

Solvency ratio (Net Profit/Total Debt)

The solvency ratios follow a similar path of the ROA ratios. The deterioration of the solvency ratio for the non-tradable sector during Phase III and the improvement of the tradable sector during Phase IV are shown in Figure 6.27.

Figure 6.27: Solvency ratio by sector



Source: Appendix C

Summary of findings

This sub-section summarises the findings of the above analysis. In terms of investments, while the tradable sector shows a constant growth with an improvement during the second half of Phase IV, the non-tradable sector shows a rapid increase mostly during Phase II and, mildly, during Phase III and from 2007 onwards. This sudden increase is obviously linked to the privatisation process and the FDI allocated to the Utilities and Telecommunication sector as shown in the previous section. This coincides with an increase in profits which faded during Phase III. However, while profits are declining, the sector increases its indebtness: the leverage ratio deteriorates and the balances of US dollar liabilities increase. This process continued until the end of the 1990s confirming the findings of the previous section.

An interesting observation is that the increase in indebtness happens not only during a period of lower profits, but also during the commodity boom period after 2007 when profits are

high. The composition of this indebtness has been analysed in the previous section at sectoral level, the Construction and the Electricity Sectors appeared the most indebted. The increase of foreign indebtness in the non-tradable sector confirms the hypothesis that the non-tradable sectors tend to have a higher pro-cyclicality and tend to grow, in terms of both assets and liabilities, at faster pace relatively to the tradable sectors during commodity booms. This development may be interpreted in terms of symptoms of Dutch disease, or, more appropriately to the argument of this thesis, to a source of financial fragility (adapting the Minskyian business cycle theory, see Chapter 3), according to which, margins of safety keep on shrinking as the commodity boom continues.

This leads to two conclusions: first, the non-tradable sector is the one which benefits the most from central bank interventions since it is the one which tends to accumulate more liabilities in US dollars; second, debt is accumulated not only in periods of low profits, decreasing liquidity and solvency, but also during periods of above-average growth, high profitability, liquidity and solvency: during Phase III, the accumulation of foreign currency debt has different consequences relatively to the Phase IV given the different RER dynamics.

The tradable sector has a crucial role in triggering the profits increase in the non-tradable sector during Phase IV. It shows a more stable path of all variables during the whole period: investments, liquidity, solvency and profitability maintain a pro-cyclical nature without any apparent contradictory results. The leverage and indebtness paths are similar to the non-tradable sector with increase in debt levels during Phase III and after 2007, but they are less pronounced.

Overall the current section confirms that, beside the differences between the two sectors, firms have their operational financing priorities which are not completely dependent on RER phases. This is confirmed by the lags in the change of variables values relatively to the change of RER from one phase to the next. In reality, firms may follow other criteria in managing their balance sheet: for example, they accumulate foreign debt because it is the only credit available, or, alternatively, balance sheets are managed in consolidated fashion since many firms belong to conglomerates. This will be the focus of the next section.

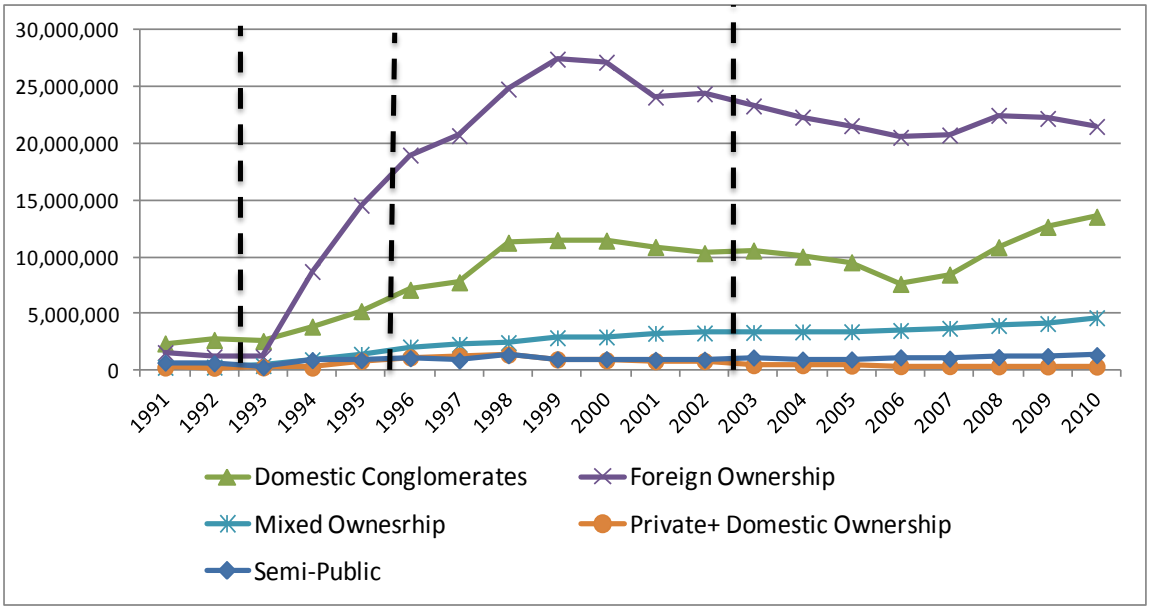
6.3.3 Analysis by ownership

This sub-section presents an analysis of investments, net profits, US dollar debt and financial ratios by using the categorisation of ownership (domestic conglomerates, small private ownership, foreign ownership, mixed ownership, semi public) as described in chapter 4.

Investments

Investments present a bifurcation between large (multinational and conglomerates) versus small corporations. Domestic Conglomerates and Foreign Ownership own most of the investments. Foreign owners benefit from the effect of the privatisation process (Phase II), while domestic conglomerates increase their investments especially during the commodity boom (Figure 6.28).

Figure 6.28: Investments by ownership (Thousands of nuevos soles) (constant prices base year 2005)

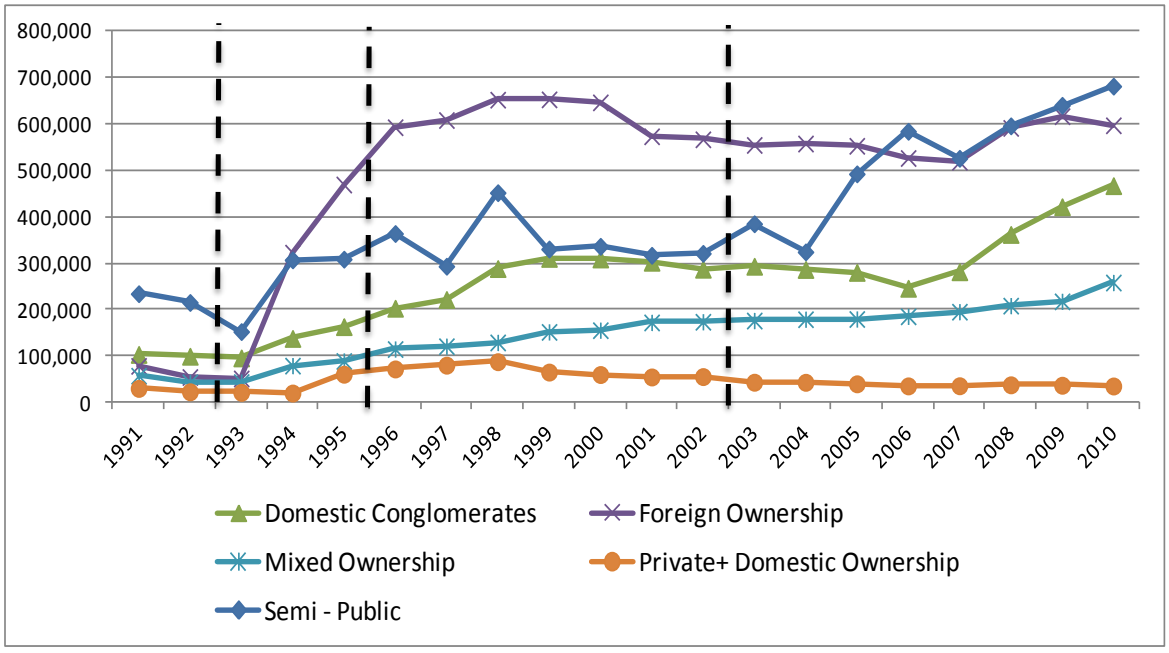


Source: Appendix C

Once the different types of ownership are weighted by the number of firms a clear hierarchy emerges and large capital is associated with higher investments: Foreign Ownership displays high levels of investments, followed by Domestic Conglomerates, then the mixed ownership, and lastly the single domestic private owners.

The privatisation of state enterprises (mostly utilities), whether under state control (with only a small stake in the hands of private investors) or in foreign hands, produced the highest level of investments at the end of the period (Figure 6.29).

Figure 6.29: Average investments by ownership (Thousands of nuevos soles) (constant prices base year 2005)

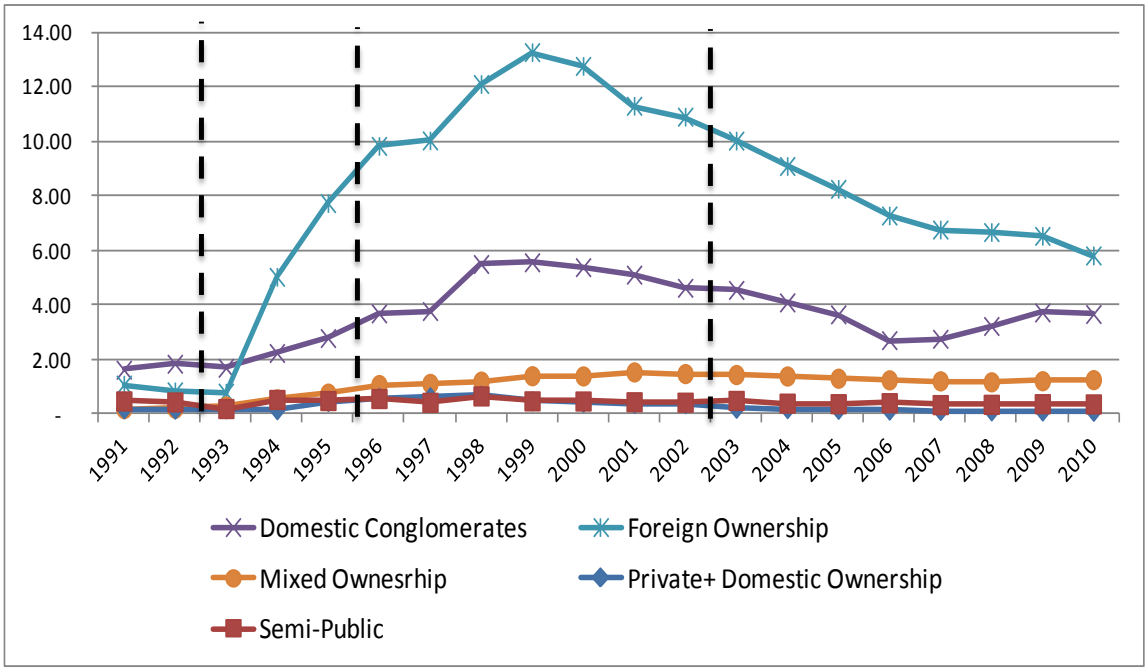


Source: Appendix C

In terms relative to the business cycle, large corporations mostly invest during Phase II and at the beginning of Phase III during privatisation and liberalisation. Then, only in the second half of Phase IV, there is an increment for the Domestic Conglomerates, especially Services and

Construction sectors, associated to the non-tradable sector, as discussed in the previous section (Figure 6.30).

Figure 6.30: Investments by ownership (percentage of GDP)

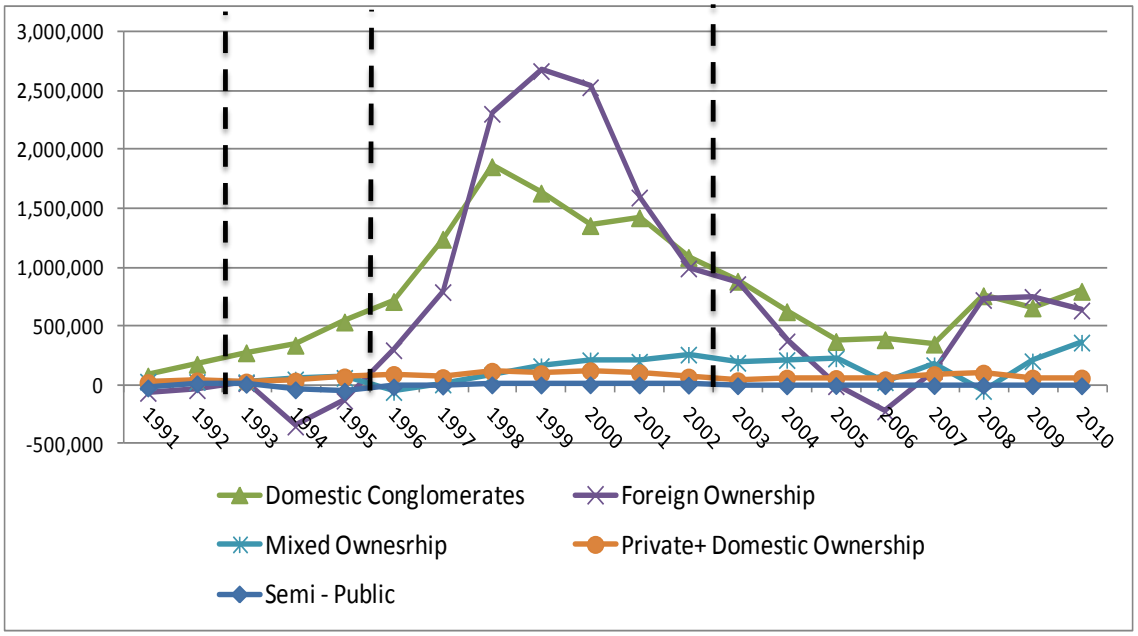


Source: Appendix C

Net US debt Dollar Balance (US dollar debt- US dollar assets):

My database shows that, with respect to the net balance of dollar holdings, almost all the exchange rate risk is taken on by the same two largest groups with the highest levels of investments, Foreign Owners and Domestic Conglomerates. This shows that the credit market is bifurcated and that large corporatations are able to access US dollar credit more easily than other firms (Figure 6.31).

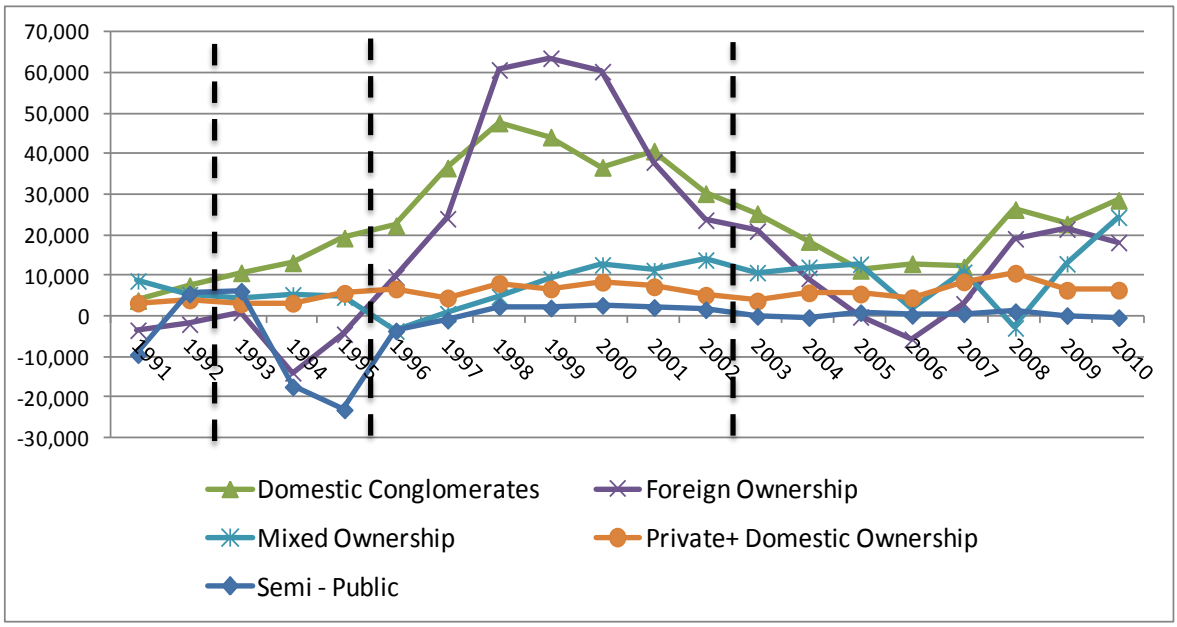
Figure 6.31: Net US Dollar debt balance (Thousands of US dollar) (constant prices base year 2005)



Source: Appendix C

The average value by firm shows that Foreigner Ownership is the most exposed to balance sheet effect during Phase III, while at the end of Phase IV the risk appears to be similar for Domestic Conglomerates and Mixed Ownership (Figure 6.32).

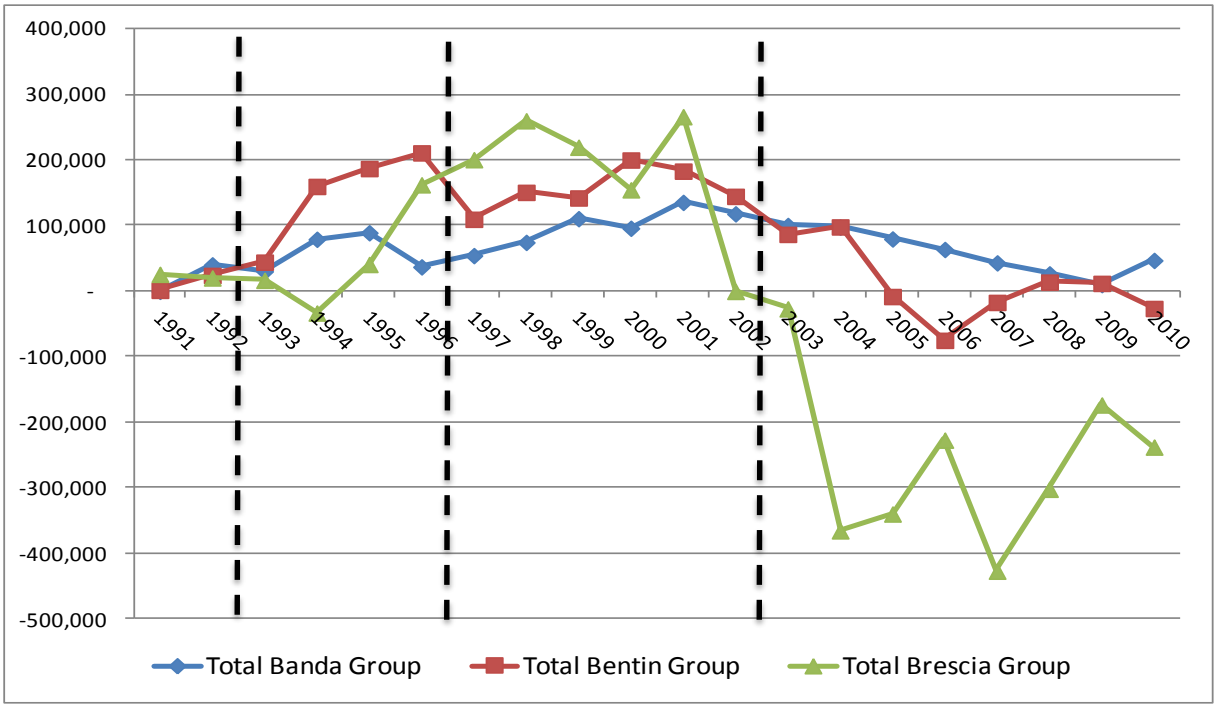
Figure 6.32: Average net US dollar debt balance by ownership (Thousands of US$) (constant prices base year 2005)



Source: Appendix C

My database also provides an additional finding by aggregating results for different firms under the same ownership. This allows us to understand whether large domestic conglomerates manage their entire holding in order to offset their individual firms' exchange rate risks. The figure below shows the sum of the net dollar balance for the three larger groups: the Banda group deals mostly in the Agribusiness and Commerce sectors; the Bentin group is involved in Manufacturing, Commerce and Services sectors; the Brescia group deals with Mining, Fishing, Services and Construction sectors. In the case of Brescia, it is interesting to note that there is a diversification of risk during Phase IV. The group holds firms in the Mining Sector (which is the sector with higher US dollar assets, less exchange rate risk) and the Construction Sector (which increases its level of debt during the second part of Phase IV). The overall balances are illustrated in Figure 6.33 below.

Figure 6.33: Net US dollar debt balance for the three larger domestic conglomerates (Thousands of US$) (constant prices base year 2005)

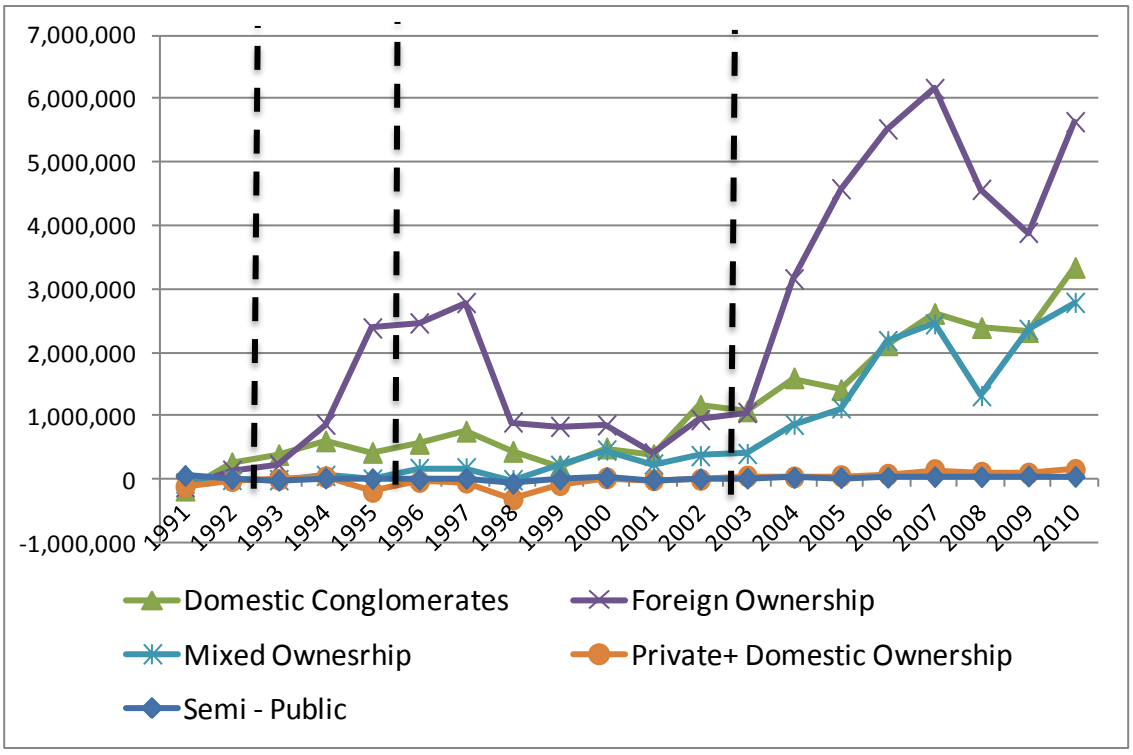


Source: Appendix C

Net Profits

For each category, net profits follow the same ranking of investments. However, the pro-cyclicality of profits is mostly concentrated in firms with Foreign Ownership between Phase II and III. Only during Phase IV, do firms with Mixed Ownership and Domestic Conglomerate show profits close to foreign firms. Foreign Ownership is spread across all sectors and especially in the Mining, Services and Commerce sectors which show high profits during Phase IV, as shown in the previous sub-section. The other sector which shows high profit is Construction which is mostly owned by Domestic Conglomerates (Figure 6.34).

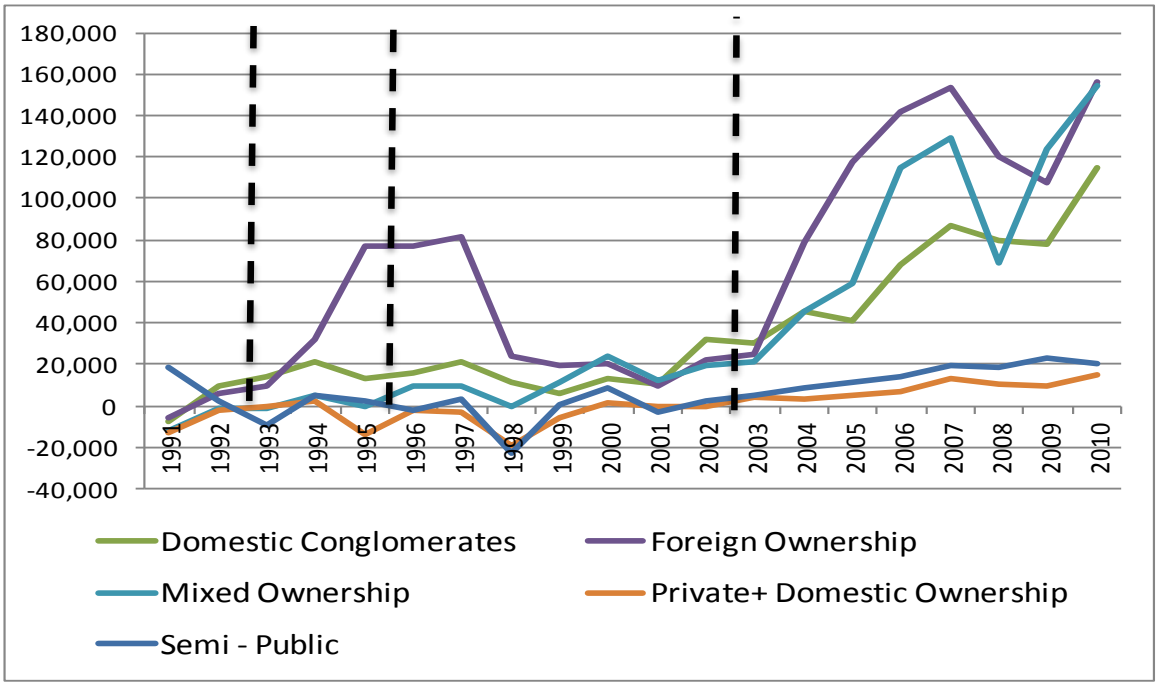
Figure 6.34: Net profits by conglomerates (Thousands of nuevos soles) (constant prices base year 2005)



Source: Appendix C

The average profit by firm type shows that the three categories mentioned above almost reach the same net profits during Phase IV. Figure 6.35 underlines once again the difference between firm belonging to large or foreign capital and the others.

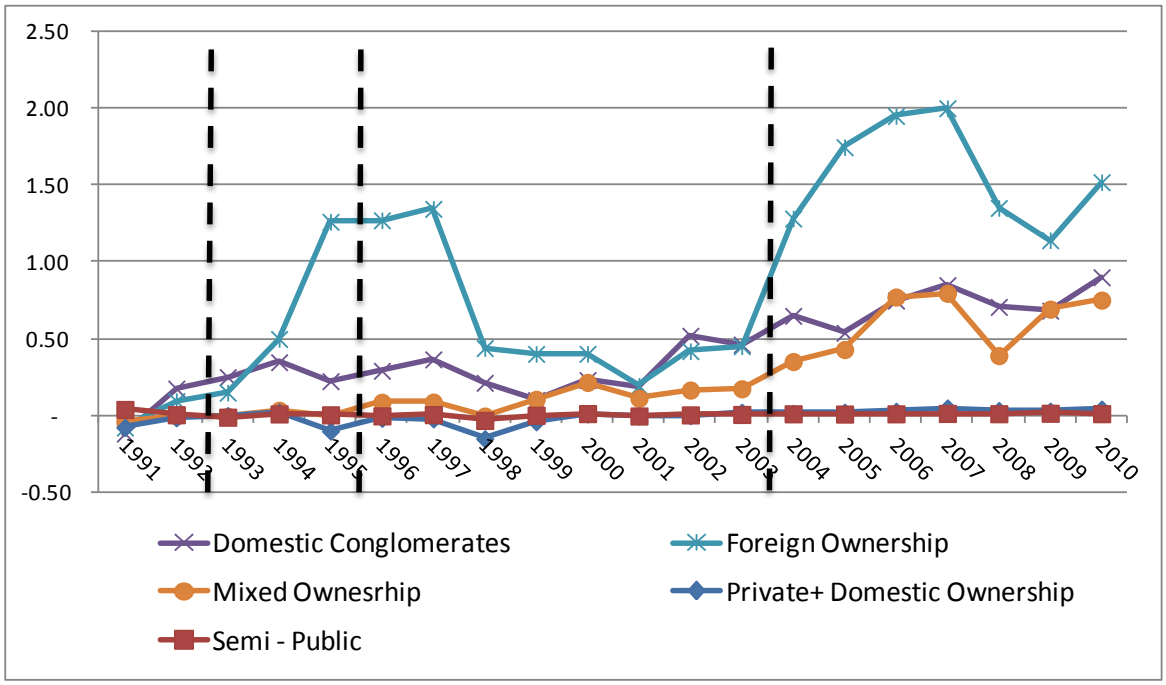
Figure 6.35: Average net profits by conglomerates (Thousands of nuevos soles) (constant prices base year 2005)



Source: Appendix C

In relation to the business cycle fluctuations the Foreign Ownership remains the category with higher profits:

Figure 6.36: Net profit by conglomerates (percentage of GDP)



Source: Appendix C

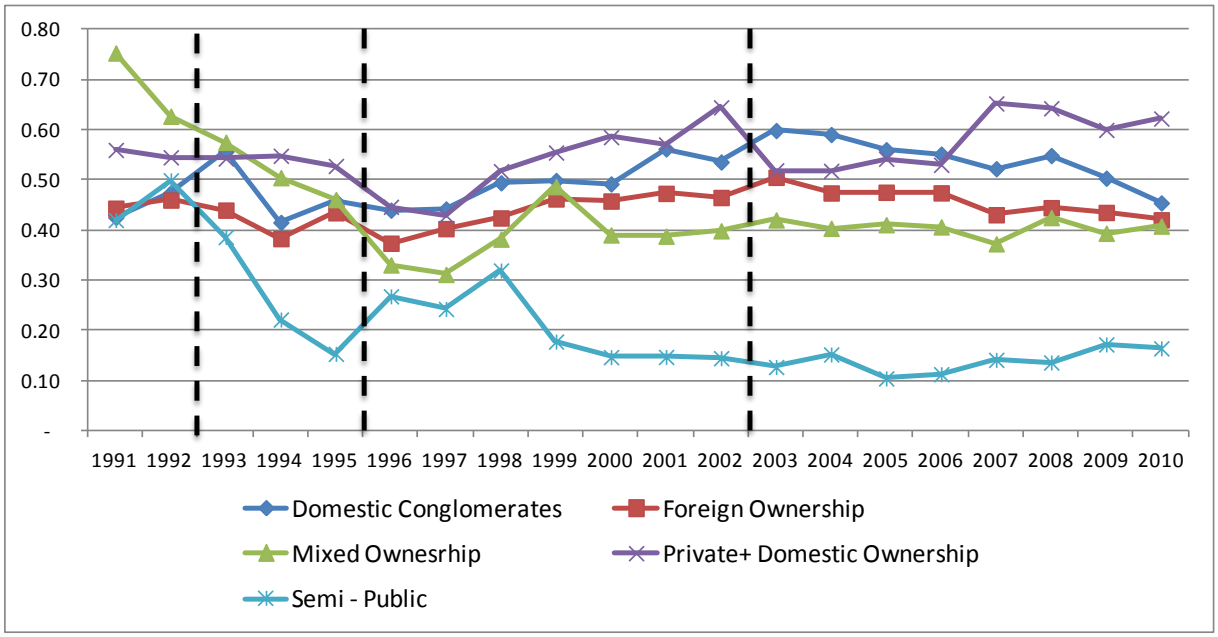
Financial Ratios

This section will analyse the financial ratios of firms grouped by type of ownership.

Leverage ratio (Total Liabilities/ Total Asset)

The path of the leverage ratio follows the pro-cyclicality commented in the previous sections. However, this categorisation shows that the most leveraged firms are owned by Peruvians, either Private Owners or large Domestic Conglomerates. As expected, semi-public companies are the least leveraged (Figure 6.37).

Figure 6.37: Leverage ratio by ownership

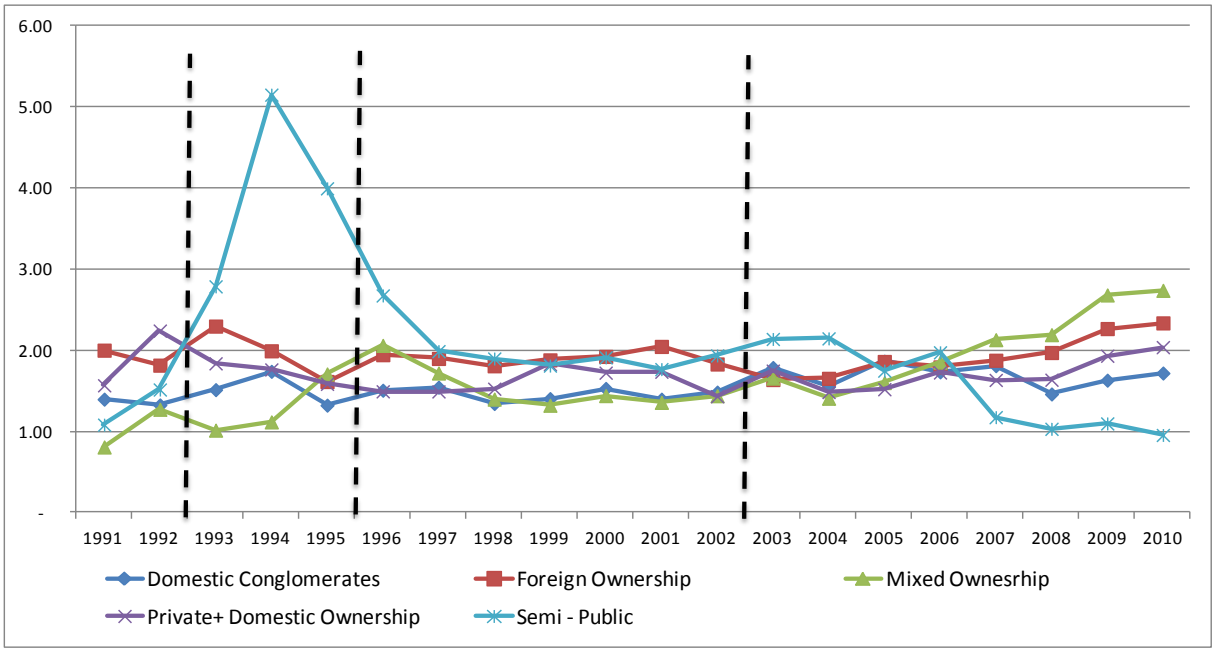


Source: Appendix C

Liquidity ratio (Current ratio = Current Asset/Current Liabilities)

The current ratio shows no great divergence between different ownership categories apart from two instances which coincide with the two episodes of high growth rates and RER appreciation (Phase II and Phase IV). During Phase II, Semi-Public and Foreign Ownership are those involved in the privatisation process. During Phase IV the hierarchy changes as Mixed Ownership and Foreigner Ownership shows higher levels of liquidity ratio since these are the ones involved in the Mining sector (Figure 6.38).

Figure 6.38: Liquidity ratio by ownership

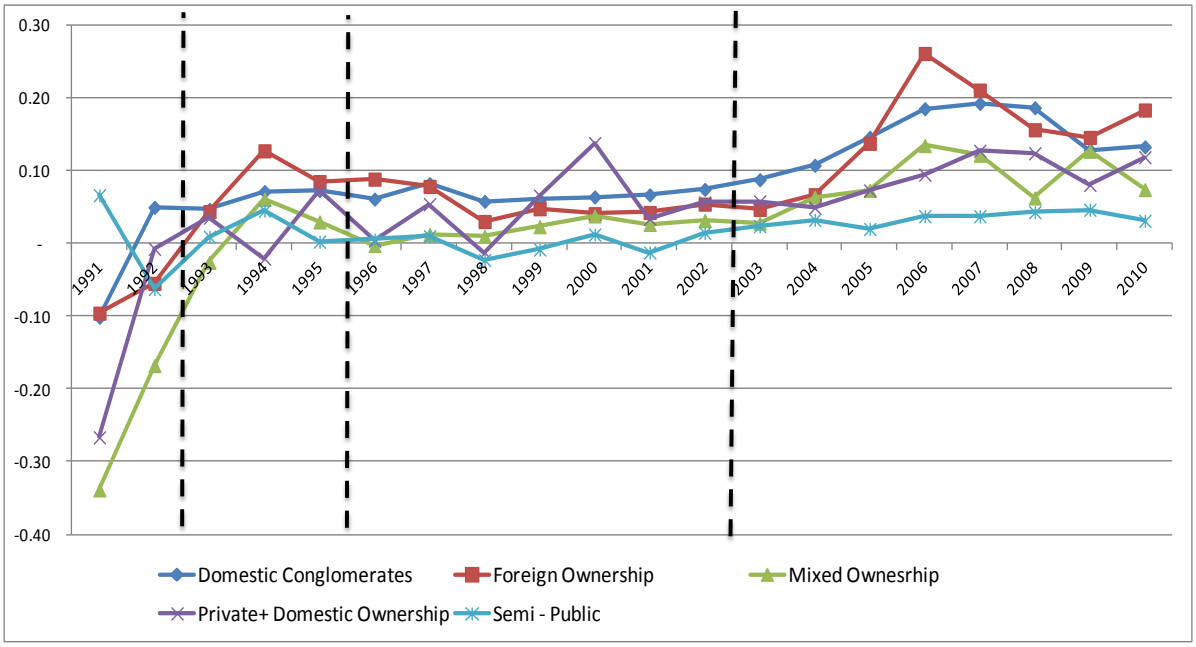


Source: Appendix C

ROA ratio (Operating Profit/ Total Assets)

Following the previous analysis it is not a surprise that large corporations (Foreign Ownership and Domestic Conglomerates) have the best profitability, as shown by the ROA ratio in Figure 6.39.

Figure 6.39: Return on asset by ownership

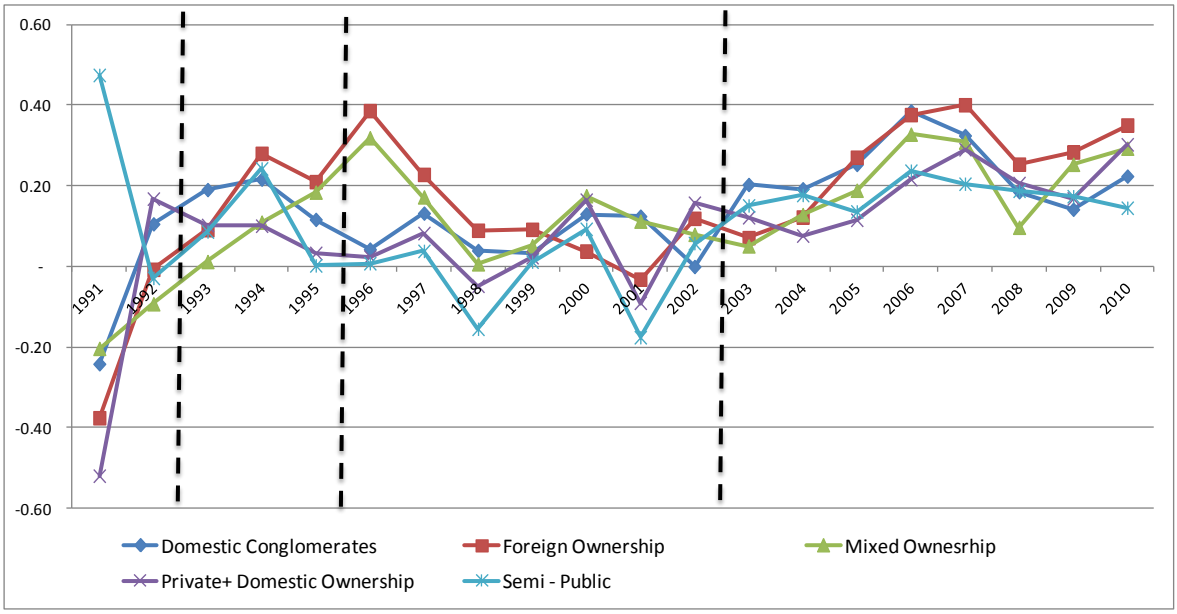


Source: Appendix C

Solvency ratio (Net Profit/Total Debt)

Within the pro-cyclicality of the ratios, firms in the category of Foreign Ownership have the higher solvency ratio. The worst are the firms co-owned with the public sector. Besides the latter, the Private ones appear to have the lowest levels of solvency (Figure 6.40).

Figure 6.40: Solvency ratio by ownership



Source: Appendix C

Summary of findings

There is a hierarchy between large firms, either owned by foreigners and multinationals or by large domestic conglomerates, and small firms. This is reflected in the performance with respect to investments and profits. Best profitability is attached to foreign ownership and large domestic conglomerates, followed by mixed ownership. The same can be said relatively to the exchange rate risk: for example, the privatised Service Sector, which holds large US dollar debt balances, is in the hands of foreigners which demonstrate a higher capacity to access credit in dollars, along with large domestic conglomerates. Finally, leverage is a domestic issue irrespectively of the size of the firm. The leverage ratio shows that both privately owned and large conglomerates have the higher levels, with the latter also indebted in dollar term. Domestic fragilities are reflected in the solvency and liquidity ratios which have a pro-cyclical nature.

6.4 The development of the structure and its fragility

The aim of this section is to analyse the growth breakdown by sector reported by the INEI (2001) to verify and elaborate the final conclusions on the structure of the Peruvian economy, its changes over the last twenty years, its prospective developments and its fragility.

Data on sectoral contributions to GDP published by the INEI (2011) are reported in the next table (Table 6.3): the impressive conclusion is that, despite the 1990s reform, privatisations, opening up of trade and financial accounts, and financial deepening, the structure of the economy in 2010 remains almost exactly the same as in 1991. There are only relatively small differences: the Mining Sector now contributes to six percent of GDP (it was 4.5 percent in 1991); the Manufacturing Sector has shrunk from 16 percent of GDP to 15 percent, and most of the loss has been in the Textile and Leather industry. The Construction Sector has gained about 2.5 percent in share of GDP in the whole period.

The next table (Table 6.4) shows the real growth rate at constant prices by sector which provides an idea on the dynamic transformations, if any. This table compares the growth rates of different periods. It shows which sectors benefited more from the commodity boom period.

In terms of overall growth rates, the commodity boom period (2003-2010) shows an average growth rate of 6.5 percent, despite the inclusion of the blip related to the sub-prime crisis; the growth rate during the rest of the period under investigation (1991-2003) was of about four percent.

In terms of the sectoral breakdown, surprisingly, the growth rate of the Mining Sector during the commodity boom is almost half the growth rate of the previous period, 3.9 percent versus 7.5 percent. This shows that most of the profits of the sector are due to changes in the prices of commodity rather than due to an increase of production even though I found an increase in investment expenditure.

Unexpectedly, the overall Manufacturing Sector reported higher growth rates during the commodity boom relatively to the previous period, 6.6 percent versus 3.4 percent. There is a recover of the Textile and Leather Sectors and a creation of an oil refining sector with its chemical linkages due to discover of new oil sites. Both the non-metallic production industry flourished and the metallic one have reached growth rate of about 12 percent.

The Service Sector has mixed results, the utilities shows the same growth rate in the two periods (about 5.5 percent), while all other services (i.e Construction 11 percent, Transportation eight percent and Financial Services 11 percent) show particularly high rate of growth confirming that the non-tradable sector has the higher growth rate during the boom.

Lastly, data for the 2009 recession provides information about the external fragility: the sectors which appear more fragile are the Manufacturing Sector (drop of growth of about 16 percent between 2008 and 2009) and consequently the Commerce (-13 percent), the Utility (-6.5 percent) and Transportation (-9.5 percent) sectors. Along the Manufacturing sector, the most dramatic drop is shown in the Construction sector (-10.5 percent) which I found to be the most leveraged sector and potentially fragile.

In conclusion, if the Manufacturing Sector will continue to grow at the recent rate, it might regain the one percent drop in the share of GDP. However, the structure of the economy is essentially unchanged. Nonetheless, the development of the Manufacturing sector remains problematic given its performance and the ratio analysis. At the same time, the expansion of the non-tradable sector is accompanied by an exposure in dollar.

The question of why the composition of output has not changed in the recent history of the Peruvian economy triggers doubts on the feasibility of development in terms of structural change away from primary commodities towards a more diversified production structure. More specifically, in the 1990s, at the time of deregulation, privatisation and trade opening up, the economy was dependent upon fishing, mining and oil. Entrance of foreign capital was considerable also as a result of privatisation: in the 1990s, the government approved 373 contracts with mining, energy and oil firms (Durand, 2002). Average tariffs were lowered from 66 to 15 per cent which contributed to an increase in import and a decrease in manufacturing

output (Klarén, 2000; Abugattás, 1999). The late 1990s financial crises also led to a restructuring and concentration of the banking system like in the rest of Latin America (Wierzba and Golla. 2005). A number of new associations emerged in the export (COMEX) and in the financial sectors and new associations of foreign capital emerged such as the American Chamber of Commerce, the Peruvian-Spanish Chamber of Commerce (Durand, 2002). The Fujimori administration often selected representatives of the associations of the export and financial sectors for positions as economic ministers (Durand, 2002, for extensive list of examples). The intensification of associations representing specific economic interests and the government continued during the 2000s (Schneider, 2009). In the meantime, labour market reforms and the decline of labour organisations lost importance (Vidal-Bermúdez et al., 2012).

Table 6.3: Real GDP share by sector (constant 1994 prices) (percentage) (1992-2010)

	SHARE OF GDP																			
EconomicActivities	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
AGRICULTURE	**8.0%**	**7.3%**	**7.6%**	**7.6%**	**7.7%**	**7.9%**	**7.8%**	**7.9%**	**8.6%**	**8.9%**	**8.9%**	**9.0%**	**8.9%**	**8.4%**	**8.2%**	**8.3%**	**7.9%**	**7.7%**	**7.8%**	**7.5%**
FISHING	**0.5%**	**0.7%**	**0.7%**	**0.7%**	**0.6%**	**0.5%**	**0.5%**	**0.4%**	**0.5%**	**0.6%**	**0.5%**	**0.5%**	**0.4%**	**0.6%**	**0.5%**	**0.5%**	**0.5%**	**0.5%**	**0.4%**	**0.3%**
MINING	**4.4%**	**4.5%**	**4.7%**	**4.7%**	**4.5%**	**4.6%**	**4.7%**	**4.9%**	**5.5%**	**5.5%**	**6.0%**	**6.4%**	**6.5%**	**6.5%**	**6.6%**	**6.2%**	**5.8%**	**5.7%**	**5.7%**	**5.3%**
OIL AND GAS EXTRACTION	0.9%	0.9%	0.9%	0.8%	0.7%	0.7%	0.6%	0.6%	0.6%	0.5%	0.5%	0.5%	0.4%	0.4%	0.5%	0.5%	0.5%	0.5%	0.6%	0.7%
MINERALS EXTRACTIONS	3.2%	3.3%	3.5%	3.8%	3.8%	3.9%	4.1%	4.3%	4.9%	5.0%	5.5%	5.9%	6.0%	6.0%	6.1%	5.7%	5.4%	5.2%	5.1%	4.6%
MANUFACTURING	**16.1%**	**15.7%**	**15.5%**	**16.0%**	**15.5%**	**15.4%**	**15.1%**	**14.7%**	**14.5%**	**14.9%**	**14.9%**	**15.0%**	**15.0%**	**15.3%**	**15.4%**	**15.4%**	**15.7%**	**15.6%**	**14.3%**	**15.0%**
FOOD INDUSTRY	4.8%	4.9%	4.8%	4.9%	4.4%	4.4%	4.3%	4.1%	4.6%	4.7%	4.7%	4.7%	4.6%	4.6%	4.5%	4.6%	4.7%	4.6%	4.6%	4.4%
MILK PRODUCTS	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.3%	0.3%	0.3%	0.3%	0.3%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
FRESH AND PROCESSED FISH	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%	0.3%	0.3%	0.3%	0.4%	0.4%	0.4%	0.3%	0.2%
FLOUR AND FISHING OIL	0.5%	0.6%	0.7%	0.9%	0.6%	0.6%	0.5%	0.3%	0.6%	0.7%	0.5%	0.5%	0.3%	0.5%	0.4%	0.3%	0.3%	0.3%	0.2%	0.2%
MILL AND BAKERY	1.2%	1.3%	1.3%	1.2%	1.0%	1.0%	1.0%	1.1%	1.2%	1.1%	1.2%	1.2%	1.1%	1.0%	1.0%	1.0%	0.9%	0.9%	0.9%	0.8%
SUGAR PRODUCTION	0.2%	0.1%	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
OTHER FOOD PRODUCTION	1.6%	1.7%	1.6%	1.6%	1.5%	1.5%	1.5%	1.6%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.9%	1.9%	1.9%	2.0%
DRINKS AND TOBACCO	0.8%	0.8%	0.7%	0.7%	0.7%	0.6%	0.6%	0.6%	0.7%	0.6%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%
TEXTILE AND LEATHER INDUSTRY	3.2%	3.0%	2.8%	2.8%	2.7%	2.6%	2.6%	2.4%	2.2%	2.3%	2.3%	2.3%	2.4%	2.5%	2.4%	2.1%	2.1%	1.8%	1.3%	1.7%
TEXTILES INDUSTRY	1.3%	1.2%	1.1%	1.0%	1.0%	1.0%	1.0%	0.9%	1.0%	1.0%	1.0%	1.1%	1.1%	1.2%	1.2%	1.1%	1.1%	0.8%	0.6%	0.7%
GARMENT INDUSTRY	1.4%	1.4%	1.3%	1.4%	1.4%	1.3%	1.2%	1.1%	1.0%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.0%	1.0%	0.9%	0.6%	0.9%
LEATHER INDUSTRY	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SHOE INDUSTRY	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%
WODDEN AND METAL FORNITURE INDUSTRY	0.5%	0.5%	0.6%	0.6%	0.6%	0.7%	0.6%	0.5%	0.4%	0.5%	0.4%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.4%	0.4%
PAPER INDUSTRY	0.8%	0.7%	0.7%	0.8%	0.8%	0.8%	0.7%	0.8%	0.8%	0.9%	0.9%	1.0%	1.0%	1.1%	1.2%	1.2%	1.2%	1.4%	1.3%	1.4%
PAPER INDUSTRY	0.3%	0.2%	0.2%	0.3%	0.3%	0.3%	0.3%	0.3%	0.4%	0.5%	0.5%	0.5%	0.5%	0.6%	0.6%	0.6%	0.7%	0.8%	0.7%	0.8%
PRINTING AND PUBLICATION	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.4%	0.4%	0.4%	0.4%	0.4%	0.5%	0.5%	0.5%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%
CHEMICALS INDUSTRY	2.8%	2.7%	2.7%	2.7%	2.5%	2.5%	2.6%	2.5%	2.5%	2.5%	2.6%	2.6%	2.5%	2.6%	2.7%	2.7%	2.7%	2.6%	2.6%	2.7%
BASIC CHEMICAL INDUSTRY	0.6%	0.5%	0.5%	0.5%	0.4%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.6%	0.5%	0.6%	0.5%	0.4%	0.4%
PHARMACEUTICALS	0.6%	0.5%	0.4%	0.4%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
OTHER CHEMICAL PRODUCTS	0.5%	0.6%	0.6%	0.6%	0.6%	0.7%	0.7%	0.6%	0.6%	0.7%	0.7%	0.7%	0.7%	0.8%	0.8%	0.8%	0.9%	0.9%	0.8%	0.9%
OIL REFINERING	0.8%	0.9%	0.9%	0.8%	0.8%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.6%	0.6%	0.7%	0.6%	0.6%	0.6%	0.7%	0.8%
RUBBER AND PLASTIC PRODUCTS	0.3%	0.3%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.4%	0.4%	0.5%
NON METALLIC PRODUCTION INDUSTRY	0.8%	0.8%	0.8%	1.0%	1.1%	1.2%	1.2%	1.3%	1.1%	1.0%	1.0%	1.1%	1.1%	1.2%	1.2%	1.3%	1.4%	1.5%	1.5%	1.7%
BASIC METALL INDUSTRY	1.1%	1.2%	1.2%	1.1%	1.1%	1.1%	1.2%	1.2%	1.2%	1.3%	1.3%	1.3%	1.4%	1.4%	1.4%	1.3%	1.2%	1.2%	0.9%	0.8%
IRON AND STEEL INDUSTRY	0.3%	0.3%	0.3%	0.4%	0.4%	0.4%	0.4%	0.5%	0.4%	0.4%	0.4%	0.4%	0.4%	0.5%	0.5%	0.5%	0.5%	0.5%	0.4%	0.4%
NON FERROUS METAL INDUSTRY	0.8%	0.9%	0.9%	0.8%	0.7%	0.7%	0.7%	0.8%	0.8%	0.8%	0.8%	0.9%	1.0%	0.9%	0.9%	0.8%	0.7%	0.7%	0.5%	0.4%
METALLIC PRODUCTION INDUSTRY	1.6%	1.4%	1.3%	1.5%	1.6%	1.5%	1.5%	1.5%	1.2%	1.2%	1.2%	1.1%	1.1%	1.1%	1.1%	1.2%	1.4%	1.6%	1.3%	1.6%
VARIOUS METALLIC PRODUCTION	0.5%	0.4%	0.5%	0.6%	0.6%	0.6%	0.7%	0.7%	0.6%	0.6%	0.6%	0.6%	0.7%	0.6%	0.7%	0.7%	0.8%	0.9%	0.7%	0.9%
NON ELECTRIC MACHINERY	0.3%	0.2%	0.2%	0.3%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
ELECTRIC MACHINARY	0.6%	0.4%	0.4%	0.3%	0.4%	0.4%	0.4%	0.3%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%	0.3%	0.3%	0.2%	0.2%
TRANSPORTATION MATERIALS	0.4%	0.3%	0.2%	0.3%	0.3%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%	0.2%	0.3%	0.3%	0.4%
OTHER MANUFACTURING PRODUCTIONS	0.5%	0.5%	0.5%	0.6%	0.6%	0.5%	0.5%	0.5%	0.5%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.5%	0.4%	0.4%	0.4%
ELECTRICITY AND WATER	**1.9%**	**1.8%**	**1.9%**	**1.9%**	**1.8%**	**1.8%**	**1.9%**	**2.0%**	**2.1%**	**2.1%**	**2.1%**	**2.1%**	**2.1%**	**2.1%**	**2.1%**	**2.1%**	**2.1%**	**2.0%**	**2.0%**	**2.0%**
CONSTRUCTION	**4.0%**	**4.1%**	**4.6%**	**5.6%**	**6.0%**	**5.7%**	**6.2%**	**6.3%**	**5.6%**	**5.0%**	**4.7%**	**4.8%**	**4.8%**	**4.8%**	**4.9%**	**5.2%**	**5.6%**	**5.9%**	**6.2%**	**6.7%**
COMMERCE	**14.5%**	**14.4%**	**14.2%**	**14.6%**	**14.9%**	**14.7%**	**14.8%**	**14.4%**	**14.2%**	**14.3%**	**14.4%**	**14.1%**	**13.9%**	**14.1%**	**14.0%**	**14.5%**	**14.6%**	**15.0%**	**14.8%**	**15.0%**
TRANSPORT AND COMMUNICATIONS	**7.6%**	**7.9%**	**7.9%**	**7.5%**	**7.7%**	**8.0%**	**7.9%**	**7.8%**	**7.9%**	**7.9%**	**7.8%**	**7.7%**	**7.8%**	**7.9%**	**8.0%**	**8.1%**	**8.9%**	**8.9%**	**8.9%**	**8.7%**
FINANCIAL SERVICES	**1.9%**	**1.6%**	**1.6%**	**1.6%**	**2.3%**	**2.6%**	**2.8%**	**2.9%**	**2.5%**	**2.3%**	**2.1%**	**2.1%**	**2.1%**	**2.0%**	**2.2%**	**2.3%**	**2.4%**	**2.5%**	**2.9%**	**2.9%**
INSURANCE	**0.2%**	**0.2%**	**0.2%**	**0.2%**	**0.2%**	**0.2%**	**0.2%**	**0.2%**	**0.3%**	**0.4%**	**0.3%**	**0.4%**	**0.5%**	**0.4%**	**0.4%**	**0.4%**	**0.4%**	**0.4%**	**0.4%**	**0.4%**
HOUSING RENTS	**3.0%**	**3.0%**	**2.9%**	**2.6%**	**2.4%**	**2.4%**	**2.4%**	**2.4%**	**2.5%**	**2.6%**	**2.7%**	**2.7%**	**2.6%**	**2.6%**	**2.5%**	**2.4%**	**2.3%**	**2.1%**	**2.2%**	**2.0%**
LOAN SERVICES TO FIRMS	**7.2%**	**7.5%**	**7.4%**	**7.1%**	**7.0%**	**7.0%**	**6.9%**	**6.9%**	**7.0%**	**6.9%**	**7.0%**	**6.9%**	**6.8%**	**6.9%**	**6.8%**	**6.8%**	**6.8%**	**6.9%**	**7.0%**	**6.9%**
RESTAURANT AND HOTELES	**4.4%**	**4.1%**	**4.1%**	**4.2%**	**4.0%**	**4.0%**	**4.0%**	**4.0%**	**4.0%**	**4.0%**	**3.9%**	**3.9%**	**3.9%**	**3.9%**	**3.8%**	**3.7%**	**3.7%**	**3.8%**	**3.8%**	**3.8%**
COMMERCIAL LOANS TO HHOLDS	**4.0%**	**4.2%**	**4.2%**	**4.1%**	**3.8%**	**3.7%**	**3.6%**	**3.5%**	**3.6%**	**3.5%**	**3.5%**	**3.4%**	**3.4%**	**3.4%**	**3.3%**	**3.2%**	**3.2%**	**3.1%**	**3.2%**	**3.3%**
NON-COMMERCIAL LOANS TO HHOLDS	**0.7%**	**0.7%**	**0.7%**	**0.6%**	**0.6%**	**0.6%**	**0.6%**	**0.6%**	**0.6%**	**0.6%**	**0.6%**	**0.6%**	**0.6%**	**0.6%**	**0.5%**	**0.5%**	**0.5%**	**0.5%**	**0.5%**	**0.5%**
PRIVATE HEALTH	**1.7%**	**1.7%**	**1.6%**	**1.5%**	**1.4%**	**1.4%**	**1.4%**	**1.4%**	**1.6%**	**1.6%**	**1.6%**	**1.6%**	**1.6%**	**1.6%**	**1.5%**	**1.5%**	**1.4%**	**1.3%**	**1.4%**	**1.4%**
PRIVATE EDUCATION	**3.7%**	**3.9%**	**3.8%**	**3.5%**	**3.3%**	**3.3%**	**3.1%**	**3.2%**	**3.2%**	**3.2%**	**3.3%**	**3.2%**	**3.2%**	**3.2%**	**3.0%**	**2.9%**	**2.8%**	**2.6%**	**2.7%**	**2.7%**
GOVERNAMENT SERVICES	**6.9%**	**7.1%**	**6.9%**	**6.3%**	**6.2%**	**6.3%**	**6.0%**	**6.1%**	**6.3%**	**6.2%**	**6.1%**	**6.1%**	**6.2%**	**6.2%**	**6.3%**	**6.3%**	**5.9%**	**5.6%**	**6.2%**	**5.9%**
AGGREGATE VALUE	**90.7%**	**90.4%**	**90.5%**	**90.3%**	**89.9%**	**90.0%**	**89.9%**	**89.8%**	**90.3%**	**90.3%**	**90.4%**	**90.5%**	**90.4%**	**90.3%**	**90.1%**	**90.3%**	**90.5%**	**90.3%**	**90.5%**	**90.3%**
IMPORT TAXATION	**1.2%**	**1.4%**	**1.4%**	**1.7%**	**2.1%**	**2.0%**	**2.1%**	**2.1%**	**1.9%**	**1.9%**	**1.9%**	**1.8%**	**1.9%**	**2.0%**	**2.1%**	**1.9%**	**1.7%**	**1.7%**	**1.4%**	**1.6%**
TAXATION ON GOODS	**8.0%**	**8.2%**	**8.1%**	**8.0%**	**8.1%**	**7.9%**	**8.0%**	**8.1%**	**7.8%**	**7.8%**	**7.7%**	**7.6%**	**7.7%**	**7.7%**	**7.7%**	**7.8%**	**7.8%**	**7.9%**	**8.1%**	**8.0%**
TOTAL VALUE	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source: INEI

Table 6.4: Real GDP growth by sector (constant 1994 prices) (percentage) (1992-2010)

	Real GDP Growth (constant prices 1994)																		
EconomicActivities	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
TOTAL	-0.4%	4.8%	12.8%	8.6%	2.5%	6.8%	-0.7%	0.9%	3.1%	0.2%	5.0%	4.0%	5.0%	6.8%	7.7%	8.9%	9.8%	0.9%	8.8%
AGRICULTURE	-9.1%	9.0%	13.2%	9.5%	5.2%	5.4%	0.5%	10.1%	6.6%	0.6%	6.1%	3.0%	-1.4%	5.4%	8.4%	3.2%	7.2%	2.3%	4.3%
FISHING	27.1%	3.9%	21.1%	-13.9%	-4.9%	-1.7%	-13.4%	28.2%	10.4%	-11.1%	6.1%	-10.3%	30.7%	3.2%	2.4%	6.9%	6.3%	-7.9%	-16.4%
MINING	0.9%	10.2%	12.0%	4.2%	5.2%	9.0%	3.7%	13.1%	2.5%	9.9%	12.0%	5.5%	5.3%	8.4%	1.4%	2.7%	7.6%	0.6%	-0.1%
OIL AND GAS EXTRACTION	1.3%	7.4%	-0.6%	-9.6%	-3.9%	-2.0%	-0.3%	-7.0%	-6.4%	-2.0%	0.7%	-4.3%	7.1%	23.4%	5.8%	6.4%	10.3%	16.1%	29.5%
MINERALS EXTRACTIONS	0.8%	10.9%	24.7%	7.2%	6.8%	10.8%	4.3%	15.9%	3.4%	11.1%	13.0%	6.3%	5.1%	7.3%	1.0%	2.4%	7.4%	-0.9%	-3.4%
MANUFACTURING	-3.3%	3.4%	16.7%	5.5%	1.5%	5.3%	-3.5%	-0.7%	5.8%	0.7%	5.7%	3.6%	7.4%	7.5%	7.5%	11.1%	9.1%	-7.2%	13.6%
FOOD INDUSTRY	0.8%	3.0%	15.0%	-2.7%	2.4%	3.4%	-5.3%	14.0%	6.1%	0.5%	4.3%	1.2%	5.4%	5.8%	8.4%	11.3%	8.8%	-0.4%	3.5%
MILK PRODUCTS	-5.6%	0.5%	10.2%	7.1%	1.2%	1.6%	7.6%	10.4%	17.9%	5.9%	7.4%	8.0%	18.5%	7.5%	9.5%	8.2%	11.1%	-3.0%	13.1%
FRESH AND PROCESSED FISH	-37.0%	6.5%	38.1%	16.7%	10.1%	22.6%	-43.8%	3.3%	23.9%	21.0%	-16.4%	42.6%	13.7%	2.7%	54.4%	10.8%	9.6%	-12.1%	-29.1%
FLOUR AND FISHING OIL	8.7%	24.7%	41.7%	-25.6%	8.5%	-16.0%	-49.2%	120.3%	22.9%	-29.6%	7.0%	-29.0%	56.0%	-2.1%	-24.5%	5.7%	1.0%	-12.1%	-29.1%
MILL AND BAKERY	3.8%	3.7%	3.9%	-5.7%	3.1%	5.5%	5.9%	9.1%	-2.9%	10.8%	0.2%	-2.0%	-4.3%	8.3%	2.9%	6.1%	1.0%	4.4%	-1.0%
SUGAR PRODUCTION	-16.9%	-10.6%	34.5%	6.1%	-5.7%	10.8%	-29.9%	35.7%	34.2%	4.1%	15.5%	14.6%	-29.8%	-11.7%	15.8%	12.8%	10.5%	7.2%	-4.2%
OTHER FOOD PRODUCTION	7.6%	-2.4%	11.3%	3.8%	3.0%	4.1%	6.9%	5.1%	2.9%	1.5%	6.2%	3.9%	3.9%	7.5%	10.8%	17.4%	10.8%	0.3%	12.8%
DRINKS AND TOBACCO	-4.4%	0.3%	9.7%	5.2%	-6.1%	9.7%	0.1%	2.9%	1.5%	1.7%	8.0%	2.9%	2.7%	7.5%	12.1%	7.1%	15.3%	2.8%	7.0%
TEXTILE AND LEATHER INDUSTRY	-5.7%	-1.2%	11.4%	6.8%	-0.8%	4.5%	-8.9%	-6.3%	7.3%	-1.1%	5.8%	7.4%	9.7%	2.3%	-2.1%	6.8%	-6.5%	-24.6%	36.5%
TEXTILES INDUSTRY	-7.7%	-4.0%	6.6%	4.2%	5.1%	10.0%	-9.9%	3.4%	10.0%	-3.6%	13.4%	6.9%	15.5%	4.7%	-0.2%	5.0%	-12.7%	-24.3%	22.2%
GARMENT INDUSTRY	-4.7%	0.1%	19.1%	6.7%	-4.9%	3.6%	-7.1%	-11.3%	8.7%	1.5%	4.7%	10.5%	6.0%	1.8%	-2.5%	8.4%	-2.4%	-29.9%	56.7%
LEATHER INDUSTRY	8.2%	-4.7%	-4.0%	11.3%	0.0%	-8.3%	-21.2%	-15.4%	-13.4%	0.9%	-28.5%	38.1%	5.1%	-16.5%	-5.1%	2.8%	0.6%	10.2%	8.1%
SHOE INDUSTRY	-7.3%	4.7%	1.1%	15.6%	-1.3%	-6.5%	-9.0%	-19.1%	-8.8%	-2.2%	-24.8%	-26.9%	-16.4%	-20.0%	-39.9%	25.4%	67.2%	50.5%	0.9%
WODDEN AND METAL FORNITURE INDUSTRY	-7.1%	26.5%	20.7%	11.6%	7.9%	-2.5%	-18.6%	-13.3%	8.2%	-3.7%	20.6%	-3.7%	20.0%	0.2%	3.2%	5.3%	8.2%	-11.5%	12.8%
PAPER INDUSTRY	-11.8%	-0.2%	22.1%	17.4%	0.3%	-0.5%	3.1%	6.2%	17.7%	-1.1%	11.7%	7.3%	15.0%	15.8%	8.6%	11.4%	23.3%	-8.9%	17.9%
PAPER INDUSTRY	-43.6%	7.0%	68.6%	16.1%	2.7%	4.4%	6.5%	28.6%	25.0%	-3.0%	6.8%	-0.4%	23.3%	19.3%	11.6%	14.5%	30.9%	-14.4%	20.6%
PRINTING AND PUBLICATION	9.7%	-2.6%	4.3%	18.3%	-1.1%	-3.5%	0.8%	-9.9%	10.1%	1.1%	17.3%	15.1%	7.6%	12.2%	5.4%	7.8%	14.1%	-1.2%	14.7%
CHEMICALS INDUSTRY	-2.0%	4.8%	11.5%	1.2%	3.4%	8.7%	-3.1%	-1.2%	4.6%	3.7%	4.4%	2.8%	6.1%	10.7%	8.5%	10.9%	5.7%	-0.2%	12.2%
BASIC CHEMICAL INDUSTRY	-14.9%	9.9%	5.3%	0.2%	15.4%	1.1%	8.1%	-1.7%	7.6%	-3.5%	4.8%	7.0%	8.0%	17.0%	3.3%	11.9%	-2.1%	-18.0%	14.0%
PHARMACEUTICALS	-12.3%	-12.4%	15.0%	-15.2%	-15.9%	24.3%	-24.6%	-5.7%	-0.7%	2.8%	15.7%	-1.7%	-20.9%	10.1%	27.8%	12.8%	9.1%	-1.2%	-8.0%
OTHER CHEMICAL PRODUCTS	10.6%	10.7%	17.8%	9.8%	7.2%	18.5%	-11.3%	0.0%	6.9%	5.6%	5.9%	4.8%	13.6%	4.5%	18.6%	15.0%	11.9%	-5.4%	11.1%
OIL REFINERING	3.7%	2.7%	6.8%	1.0%	0.6%	2.0%	1.8%	-3.9%	-0.2%	3.5%	-1.3%	-0.5%	8.6%	16.3%	-1.7%	5.3%	3.5%	28.1%	14.3%
RUBBER AND PLASTIC PRODUCTS	4.3%	19.8%	17.1%	7.4%	6.4%	3.3%	8.3%	4.8%	8.1%	9.5%	4.8%	2.3%	3.0%	6.5%	6.2%	9.5%	4.5%	-6.5%	19.7%
NON METALLIC PRODUCTION INDUSTRY	-2.4%	13.7%	28.9%	21.3%	11.8%	10.6%	4.8%	-15.2%	-0.1%	-0.7%	11.9%	5.6%	11.0%	12.9%	13.0%	16.3%	20.4%	-0.9%	20.7%
BASIC METALL INDUSTRY	3.5%	3.7%	9.9%	7.1%	5.4%	9.4%	4.8%	1.5%	4.2%	2.4%	10.4%	9.2%	3.9%	4.7%	6.1%	-2.1%	6.5%	-21.6%	-1.4%
IRON AND STEEL INDUSTRY	1.3%	10.7%	36.0%	21.1%	4.5%	18.7%	3.2%	-7.9%	6.3%	0.7%	2.4%	4.0%	9.8%	19.1%	12.6%	8.3%	7.4%	-20.8%	3.5%
NON FERROUS METAL INDUSTRY	4.2%	1.5%	0.9%	0.7%	5.9%	4.2%	5.8%	7.2%	3.1%	3.4%	14.7%	11.7%	1.3%	-2.2%	2.3%	-8.7%	5.9%	-22.2%	-5.3%
METALLIC PRODUCTION INDUSTRY	-16.7%	0.4%	28.0%	19.5%	-7.7%	8.2%	-3.0%	-16.8%	7.2%	0.5%	-5.1%	2.2%	3.1%	10.3%	18.9%	22.7%	22.0%	-13.2%	31.0%
VARIOUS METALLIC PRODUCTION	-7.1%	29.0%	24.0%	22.9%	1.2%	10.0%	-0.4%	-7.0%	8.3%	0.9%	3.1%	10.0%	-0.6%	11.9%	19.2%	17.2%	22.2%	-13.9%	30.3%
NON ELECTRIC MACHINERY	-10.6%	-6.2%	37.7%	23.0%	-9.4%	15.7%	-10.5%	-27.5%	4.8%	1.4%	-15.7%	-14.4%	-21.6%	9.1%	11.5%	15.2%	6.3%	-27.8%	4.0%
ELECTRIC MACHINARY	-21.9%	-11.0%	3.7%	31.9%	-4.3%	1.7%	-7.4%	-15.1%	4.2%	-0.1%	-12.4%	-10.7%	26.0%	-2.6%	17.5%	24.1%	9.9%	-25.8%	14.6%
TRANSPORTATION MATERIALS	-25.2%	-19.9%	71.3%	-3.2%	-31.3%	5.3%	7.4%	-38.2%	12.9%	-0.9%	-13.7%	8.3%	9.5%	29.8%	24.4%	49.4%	43.3%	5.7%	49.5%
OTHER MANUFACTURING PRODUCTIONS	11.0%	1.4%	43.9%	2.1%	-9.3%	-1.0%	7.2%	-11.2%	-6.4%	1.4%	1.2%	-5.8%	5.2%	9.9%	5.8%	32.2%	-0.3%	-2.9%	0.0%
ELECTRICITY AND WATER	-5.5%	14.2%	10.9%	0.2%	5.9%	12.7%	6.2%	3.0%	3.2%	1.6%	5.5%	3.7%	4.5%	5.6%	6.9%	8.5%	7.8%	1.2%	7.7%
CONSTRUCTION	2.3%	17.9%	36.1%	17.4%	-2.3%	14.9%	0.6%	-10.5%	-6.5%	-6.5%	7.7%	4.5%	4.7%	8.4%	14.8%	16.6%	16.5%	6.1%	17.4%
COMMERCE	-0.9%	2.9%	15.9%	11.1%	0.9%	7.8%	-3.1%	-1.0%	3.9%	0.9%	3.3%	2.4%	6.2%	6.2%	11.7%	9.7%	12.8%	-0.3%	9.7%
TRANSPORT AND COMMUNICATIONS	3.9%	4.4%	7.2%	11.5%	5.6%	5.6%	-1.0%	2.1%	2.6%	-0.4%	3.7%	4.9%	6.4%	8.5%	9.2%	18.9%	10.0%	0.4%	6.7%
FINANCIAL SERVICES	-15.6%	4.3%	18.0%	50.8%	15.0%	17.1%	3.2%	-14.9%	-3.9%	-9.2%	6.7%	3.6%	2.2%	12.6%	14.7%	14.9%	13.5%	15.4%	11.6%
INSURANCE	-3.1%	2.1%	1.6%	-1.0%	9.3%	34.1%	-21.6%	43.2%	48.8%	-23.1%	41.3%	24.5%	-3.0%	2.4%	6.8%	2.9%	8.0%	5.7%	6.2%
HOUSING RENTS	1.0%	-0.2%	1.1%	2.8%	2.6%	3.6%	2.1%	3.0%	9.5%	2.9%	3.7%	2.4%	2.9%	3.6%	2.7%	3.5%	3.3%	2.1%	2.8%
LOAN SERVICES TO FIRMS	4.8%	3.6%	7.5%	6.5%	3.0%	5.7%	-0.7%	2.0%	1.8%	1.1%	3.3%	3.7%	5.3%	6.1%	7.0%	9.9%	11.5%	1.4%	8.2%
RESTAURANT AND HOTELES	-6.8%	4.6%	13.6%	4.6%	3.0%	6.4%	-1.1%	1.1%	1.7%	-0.2%	3.1%	4.7%	4.5%	5.4%	5.3%	8.9%	11.1%	2.3%	7.0%
COMMERCIAL LOANS TO HHOLDS	4.4%	3.7%	9.9%	1.4%	0.9%	3.5%	-2.8%	2.2%	0.7%	-1.3%	3.6%	3.9%	3.6%	3.5%	5.1%	8.5%	8.6%	4.6%	9.6%
NON-COMMERCIAL LOANS TO HHOLDS	3.2%	-2.4%	3.7%	4.2%	1.9%	2.9%	1.2%	0.4%	2.9%	-0.7%	3.1%	3.8%	3.4%	3.8%	2.8%	3.3%	8.9%	8.9%	9.7%
PRIVATE HEALTH	-2.4%	1.3%	3.7%	1.0%	3.2%	6.1%	2.4%	14.7%	1.1%	1.9%	4.0%	3.8%	2.6%	2.3%	4.7%	2.6%	4.6%	4.5%	9.6%
PRIVATE EDUCATION	4.9%	1.0%	6.0%	2.5%	1.0%	1.4%	1.4%	2.5%	2.7%	2.5%	2.0%	4.2%	3.6%	3.0%	3.8%	4.1%	3.4%	3.8%	9.6%
GOVERNAMENT SERVICES	1.2%	3.0%	3.1%	6.7%	3.2%	2.3%	1.2%	3.5%	1.8%	-1.1%	4.6%	6.4%	4.3%	8.4%	7.6%	3.1%	3.9%	10.5%	3.6%
AGGREGATE VALUE	-0.8%	4.8%	12.6%	8.1%	2.7%	6.7%	-0.8%	1.5%	3.1%	0.3%	5.1%	3.9%	4.8%	6.7%	7.9%	9.1%	9.6%	1.1%	8.5%
IMPORT TAXATION	14.2%	8.3%	35.6%	29.9%	0.1%	10.3%	0.9%	-12.3%	3.3%	1.9%	2.7%	6.5%	13.3%	11.9%	-2.6%	-4.9%	13.6%	-18.3%	26.4%
TAXATION ON GOODS	1.3%	3.4%	11.7%	9.5%	0.6%	8.0%	0.1%	-2.4%	3.0%	-1.1%	4.3%	4.9%	4.7%	7.6%	8.7%	9.2%	11.4%	2.2%	8.3%

Source: INEI

6.5 Conclusions

This first empirical chapter identifies whether firms' investments are correlated to fluctuations of RER. It appears that, during a period in which dollar debt is accumulated and the currency depreciates, there is a strong negative effect of the RER, which is explained in the literature by the so-called balance sheet effect. This seems to override the positive effects due to the increases in competitiveness.

The same relation has been tested during a period of appreciation when the stock of dollar debt has been initially depleted and then re-accumulated. In this case, the influence of the RER declines as profits/sales have a more predominant role. However, the RER has still a negative effect on investment because of the so-called competitiveness effect. These results have two implications. Firstly, they emphasise the non-ergodicity of the economic process with respect to changes in the structure of the economy associated to different financing conditions. Secondly, adopting the Post-Keynesian view, the nexus investment-finance is considered of primary importance in the determination of the business cycle. More specifically, with respect to the object of this thesis, RER fluctuations are just a consequence of the business cycle. Thus, the pattern of the RER may have a feedback on investment, but this depends on the structure of the economy and on the development of the financing conditions. In general, it is observed that variables respond with a lag to dynamics of the RER and most of the changes are driven by a diffuse scarcity in the availability of financing, mainly due to external conditions, given the limited role of the State in terms of credit provision after the 1990s.

Consequently, and as explained in the methodological chapter, the present chapter addresses the questions related to the underlying structure of the economy in more depth, in order to try to identify possible feedback mechanisms. In addition, this second step represents a logic necessity given that the idea behind the exchange rate as a developmental tool is to induce a structural change of the economy, shifting away from the commodity dependence. Accordingly, findings across the entire period show that the economy maintains its dependence on the Mining sector which was re-enforced by the commodity boom. The most interesting dynamics are in other sectors. The actual change in the structure started in 1993 with the privatisation of the Utility and Telecommunication sectors which has brought FDI to boost investments and profitability of these sectors. All the other sectors remained linked to the business cycle fluctuations with the Construction sector particularly volatile and the

Manufacturing sector lagging behind in both investments and profits throughout. The privatised firms, owned by foreigners/multinationals and large domestic conglomerates were mostly involved in debt accumulation and leveraging during the second half of the 1990s. This includes dollar debt accumulation which, given the domestic currency depreciation of that period, implies negative balance sheet effect during a long recession. This picture does not change until the commodity boom, in which, again, the non-tradable sectors (i.e. Service and Construction sectors), after an initial period in which firms repaired their balance sheet, start to leverage in both domestic and foreign debt. Again, the firms which hold this debt are owned by foreigners or belong to domestic conglomerates.

The overall conclusion of this chapter is that the management of the RER, through intervention of the central bank, does not create, *per se*, the diversification towards non-traditional exports, namely, Manufacturing, Fishing and Agribusiness Sectors. However, for all these sectors investments lagged behind. On the contrary, it appears that, beyond the sector categorisation, the only category which benefits from the reduction of the exchange rate risk, is the one with access to external credit, namely large foreigners/multinationals and large domestic conglomerates. However, these have been more active in highly profitable sectors such as the Mining, which tends to attract FDI during the commodity boom, and the non-tradable sector, which has attracted FDI during the privatisation process.

There are three main implications from this: first, smoothing the RER has an effect that is the opposite of what the theoretical approach would suggest. This is shown in the analysis of activities growth rate by sector illustrated in the last part. Second, FDI may have a short-term beneficial effect, but, by re-enforcing the commodity trap dynamic, they may be a source of instability. A third implication is in terms of political economy: the increasing economic and political power of the Peruvian conglomerates has been discussed in the third and fourth sections of this chapter. There is extensive evidence (fourth section) that specific firms have been influencing, even directly by assuming government roles, the economic policy formation in the last two decades. This can certainly represent a constraint for the adoption of economic policies that should lead to development in terms of structural change of the economy (as defined in Chapter 1). In this respect, the indication of what is the correct policy to pursue in order to achieve a specific target (development in this case) is not a sufficient condition for to success of the policy. In fact, its adoption and enforcement may be opposed by powerful interests which can organise to influence policy formation.

In conclusion, according to the mainstream literature, the RER determines the business cycle. On the contrary, this chapter shows that, even though the Central Bank of Peru intervenes in the forex market to smooth the exchange rate pattern, the RER has not had a significant impact on the business cycle. On the contrary, the RER reflects the developments of the business cycle which depends on other factors, endogenous and exogenous. A determinant factor is given by FDI and foreign capital flows.

Consequently, investment expenditure and profits may be either in dollar (tradable/commodity production) or in soles (non-tradables). When the central bank intervenes during a period of inflows, it maintains the nuevos soles cheaper, i.e. undervalued. This favours the non-tradable sector rather than stimulating the export sector. Following this shift, the FDI may become destabilising.

How do firms respond to business cycle? Firms may adjust production to the price system; however, they may not be able to recognise shifts in relative prices. This chapter showed that firms respond to RER by financial (debt) operations.

As a result, to escape the commodity trap, interventions in the economy should be more direct to incentivise the diversification away from primary commodities. Direct credit intervention should be aimed to those tradable sectors which remain behind. Unfortunately, the institutional framework of the orthodox central banking practice does not allow for credit supply, as credit is not conceived as a public good, while exchange is controversially manipulated favouring the most exposed large conglomerates and foreign multinationals. This will be taken up in the concluding chapter. Next chapter will concentrate on alternative proposal of PEP and, more specifically on a simulation analysis.

Chapter 7 -A critique of PEP from the empirical point of view: would it work for Peru?

7.1 Introduction

Chapter 2 showed how Peg the Export Price (PEP) and real exchange rate (RER) target could be reduced to similar equations; empirically the previous chapter showed that the RER target does not pursue the policy objective of supporting the diversification of the economy.

As a result, this chapter attempts to investigate the validity of PEP through a simulation analysis, keeping in mind that while RER is supposed to be developmental, PEP should be counter-cyclical (chapter 2).

Frankel (2003, 2006) shows how the PEP target could be beneficial in comparison to any other currency peg for a number of CDDCs. I run similar simulations in order to test the effect of such proposal in Peru between 1993 and 2009. In this chapter it is applied the Peg Export Price (PEP) solution to Peru. It shows in practice that this proposition is not feasible.

The chapter is organised as follows: apart from this introduction, the second section shows Peru as a CDDC, the third section discusses the various models specifications and the fourth section runs the simulations. The fifth section draws additional considerations and the sixth section summarises the main findings of the chapter.

7.2 Peru as a CDDC

Peru is probably one of the most diversified primary commodity producer economy as shown in Table 7.1.

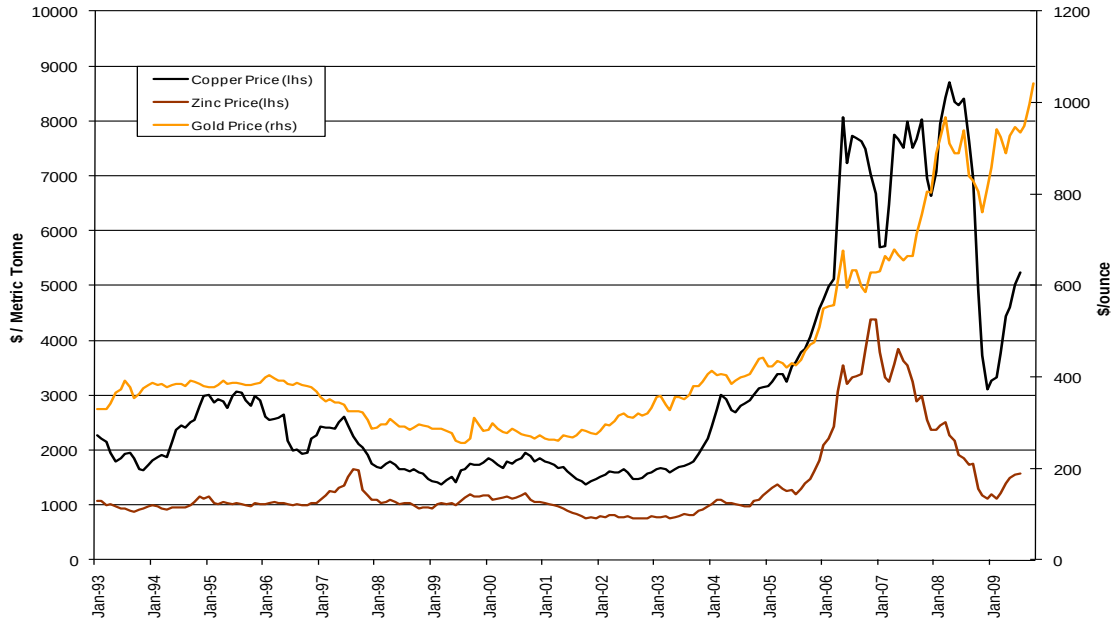
Table 7.1: Percentage exports on total exports by sector on a yearly basis (1992-2008)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Copper	23.8%	20.9%	19.6%	23.0%	18.8%	17.1%	14.7%	14.0%	14.7%	15.0%	16.8%	15.3%	20.7%	20.7%	27.1%	27.3%	25.9%
Gold	6.5%	6.5%	8.1%	9.0%	10.8%	9.8%	17.0%	20.1%	17.2%	17.9%	20.2%	23.5%	19.7%	18.3%	17.3%	15.4%	18.1%
Zinc	8.9%	8.2%	7.7%	7.0%	7.6%	7.5%	7.4%	7.3%	6.6%	5.9%	4.9%	5.1%	5.4%	5.3%	9.4%	10.1%	5.3%
Molybdenum	4.4%	3.6%	3.8%	3.8%	3.6%	3.6%	3.4%	3.2%	2.8%	2.7%	2.6%	2.8%	3.3%	6.7%	3.6%	3.5%	3.5%
Lead	3.5%	2.9%	3.0%	3.0%	3.2%	2.9%	3.0%	2.8%	2.4%	2.3%	2.2%	2.1%	2.6%	2.6%	2.6%	3.4%	3.4%
Silver	2.2%	2.2%	2.3%	2.0%	2.1%	1.8%	3.5%	3.0%	2.6%	2.3%	2.3%	2.2%	2.1%	1.6%	2.0%	2.0%	2.0%
Iron	1.7%	2.4%	2.5%	1.8%	1.4%	1.2%	1.7%	1.1%	1.0%	1.1%	1.1%	1.1%	1.0%	1.3%	1.1%	1.0%	1.2%
Tin	0.0%	0.0%	0.0%	0.0%	0.4%	0.8%	0.6%	0.3%	1.7%	0.1%	0.2%	0.2%	1.9%	1.2%	1.1%	1.3%	1.1%
Total Minerals	**51.0%**	**46.7%**	**46.8%**	**49.8%**	**47.9%**	**44.7%**	**51.4%**	**51.8%**	**49.0%**	**47.3%**	**50.2%**	**52.3%**	**56.7%**	**57.7%**	**64.2%**	**64.0%**	**60.6%**
Oil (Net Importer)	**6.0%**	**6.0%**	**4.0%**	**4.9%**	**6.6%**	**5.9%**	**4.4%**	**4.2%**	**5.9%**	**6.1%**	**6.3%**	**7.6%**	**5.6%**	**9.3%**	**8.0%**	**8.7%**	**9.1%**
Coffee	**2.2%**	**1.8%**	**4.7%**	**5.3%**	**3.8%**	**5.9%**	**5.1%**	**4.5%**	**3.3%**	**2.6%**	**2.5%**	**2.1%**	**2.3%**	**1.8%**	**2.2%**	**1.5%**	**2.1%**
Fish	**2.6%**	**3.5%**	**3.8%**	**3.8%**	**3.5%**	**3.9%**	**3.9%**	**3.1%**	**2.6%**	**3.0%**	**2.3%**	**2.4%**	**2.2%**	**1.9%**	**1.8%**	**1.8%**	**2.0%**
TOTAL	**61.8%**	**58.0%**	**59.4%**	**63.8%**	**61.8%**	**60.5%**	**64.8%**	**63.6%**	**60.7%**	**59.0%**	**61.4%**	**64.3%**	**66.9%**	**70.7%**	**76.2%**	**75.9%**	**73.7%**

Source: author's calculation on ITC data (UNCTAD/WTO 2011)

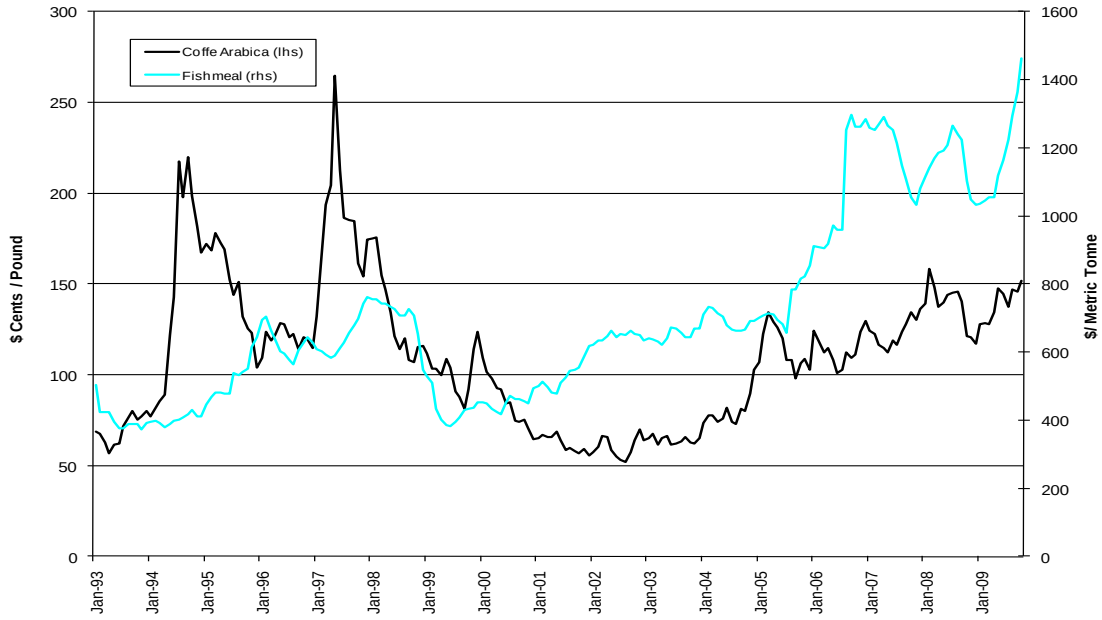
The increase in the percentage of commodity exports relatively to total export in the period under consideration depends mostly on the increase in commodity prices discussed in chapter 1. However the economy also changed its degree of trade openness, defined in terms of the sum of imports and exports as a ratio to GDP, from 28.3 in 1990 to 33.9 in 2000, to 43.6 in 2005 (IMF, 2011). The price behaviour, including the latest boom, of the three main mineral exports across the entire period is reported in Figure 7.1. Also, Peru exports hydrocarbons, but it is a net oil importer. Furthermore, prices of the main non-mineral commodities exported, coffee and fish, are shown in Figure 7.2.

Figure 7.1: Prices of the three main mineral exports (1993-2010)



Source: IMF (2011)

Figure 7.2: Prices of Coffee Arabica and Fishmeal (1993-2010)



Source: IMF (2011)

7.3 Simulation model specification

7.3.1 Defining Peg Export Price (PEP) and Peg Export Price Index (PEPI)

Following Frankel (2003; 2006), I will consider different specifications of the PEP in order to show various effects on the export revenues, exchange rate and domestic price inflation.

Firstly, I will consider a simple case of pegging to the copper price only given that copper is the main commodity exported by Peru. This specification is defined as PEP (Copper) in the next sections. Copper can also be considered as the best proxy for all metal exports given the co-movement of metal prices.

Secondly, I will consider a more complicated specification which refers to the PEPI target. The exchange rate is pegged to a basket of commodities which represent the main source of revenues for Peru. The basket is formed by the mining sector using the proportion of the revenue of each metal relative to total revenues as weights. This specification is defined as PEPI (Metal basket) in the next sections.

Thirdly, I will consider a different specification of the PEPI in which all main commodity exports are considered: I will include the two small sectors of Coffee and Fish (Table 7.1). This is run to test a number of factors: firstly, the effects of the inclusion of other (non-metal) primary commodity sectors on the exchange rate and revenues. If a commodity is included in the pegged basket, producers of this commodity will have more stable revenues since the exchange rate is influenced by the price of commodities exported; secondly, to test whether a broader export diversification would guarantee higher stability of export revenues. Therefore, I use the basket calculated for the second simulation above (PEPI Metal basket), the Coffee and the Fishmeal sectors with the same weights, a third each. I increase the weights of the Fishmeal and Coffee (and correspondingly reduce the metal sector) to use PEPI as a developmental tool for these two non-traditional sectors. This specification is called PEPI All in the next sections.

Frankel (2003; 2006) compares the two pegs PEP and PEPI to other currency pegs such as the US dollar, the Japanese Yen and the Euro. However, in the following simulations, I will compare the alternative specifications only to the current (floating) Peruvian exchange rate. This choice is dictated by the fact that Peru has abandoned the peg to the US dollar a

long time ago and that floating exchange rates are predominant in developing countries today. These simulations are run to check whether PEP target could be a feasible alternative to the current inflation target paradigm.

7.3.2 Nominal versus real prices

Once the exchange rate targets are specified, the issue of which prices to use arises: I follow Frankel (2003; 2006) and use nominal and real prices. For the nominal proposal, I calculate the effects on the exchange rate since 1993 for the three different specifications (PEP Copper, PEPI Metal Basket and PEPI All). There will be three new exchange rates derived by the monthly changes of the price of the commodities considered in each specification.

I also calculate export revenues following Frankel, even though his assumptions on output exports and price elasticities have to be reviewed and criticised: his main assumption is that a one percent devaluation of the exchange rate generates a one percent increase in export in the same year. This is the result of three preliminary conditions. Firstly, the shares of the various commodity exports to GDP remain unchanged during the period: clearly, this is a static approach to the economy, it does not fit with small open economies which may be very dynamic given the linkages with and dependence on commodity prices, and does not assume any structural change. For example, this may be reflected in an underestimation of recalculated revenues if one assumes that GDP tends to growth during a commodity boom. Secondly, in Frankel (2003; 2006), prices are set in the international market and CDDCs are assumed to be price takers. In reality, depending on their market share, CDDCs may well be price makers.[52] The price of non-tradable goods is set in the international markets and it is not influenced by domestic factors; the price of tradable goods is determined in terms of foreign prices. Thirdly, prices are expressed in US dollars, so price fluctuations do not necessary reflect real fluctuations. Finally, the local elasticity of supply is one, which is a condition that could be accepted only if absorptive capacity constraints disappear within a short time lag.

In spite of the above limitations, I rely on Frankel‘s assumptions since the commodity boom was so extraordinary that it would strongly bias an estimation of the export elasticity

[52] For example, the main export of Peru is copper and Peru is the second exporter of copper in the world. However, it only exports about a fourth of Chile which is considered the main price maker of the copper market.

with respect to the exchange rate: since Peruvian new soles is a commodity currency, the boom makes the exchange rate more sensitive to the export revenues and not vice versa. In any case, this assumption becomes more relevant in the third simulation when I include the two small sectors of fishing and coffee.

7.3.3 Calculation of exchange rate and export revenues

Assuming that the starting date for the new peg regime is the 1st of January 1993, I construct the three series where the monthly change in the nominal commodity prices would be the same as the changes in the nominal exchange rate.

In order to simulate the performance of the export revenues, I initially calculate the export revenues net of exchange rate changes: if the exchange rate depreciates monthly by one percent, I strip the extra benefit of the devaluation out from exports by taking off one percent from the monthly export revenues. In order to calculate the effects of the three different specifications (PEP Copper, PEPI Metal Basket and PEPI All) on the export revenue, I use the same process to add back to the clean series the monthly changes of the three new exchange rate pegs previously calculated.

Frankel (2003, 2006) also analyses the effects the PEP proposal on GDP and on the debt to export ratio. However, since the assumption of constant GDP is considered too strong for a small open economy and since Peru is a highly dollarised economy, this will not be pursued in this study.

Instead, I add the impact of the three specifications to domestic prices which Frankel does not engage with. Different exchange rate patterns could significantly affect domestic prices through the pass-through effect, becoming an issue for the IT of the central bank. In order to calculate the effect of the simulated exchange rates on domestic prices, I take the pass-through calculated by other researchers (Table 7.2): they all prove that Peru has a relatively low pass-through given that it mainly imports industrial inputs and machineries rather that food and consumer goods.

Table 7.2: Summary of pass-through studies for Peru

	Pass-Through	Average Life	Period
Gonzales (2000)	0.22	12 Months	1992-2000
Hausmann et al. (2000)	0.49	5 Months	1990-2000
Armas et al (2001)	0.12		1991-2000
Clinton Perrault (2001)	0.22		1990-2000
Mihaljek Klan (2001)	0.22		1990-2000
Morón Winkelried (2002)	0.1	30 Months	1992-2001
Miller (2003)	0.15	6 Months	1994-2002

Source: author's review

I will therefore use Miller's (2003) pass through of 0.15 assuming a linear average life of 6 months.[53] The process adopted for this simulation is similar to the previous ones. I will only consider nominal prices as inflation is calculated in nominal terms. Similarly to the calculation of the export revenues, initially, a nominal inflation series is created by stripping off the effects of the monthly nominal exchange rate variations from the official nominal inflation. From the clean series, I then add back the effect of the new nominal exchange rate patterns for the three specifications.

Following Frankel, I also consider the case of pegging to the real price of commodities. To this end, I follow the same process described so far; the only difference is that the starting point becomes the real commodity prices calculated in terms of nominal prices discounted by domestic inflation. I will then calculate the effects of this price changes for the three specifications on exchange rates and revenues. In terms of the effects on inflation, other considerations will be included as it would be misleading to consider the effects of real pegs on inflation given that inflation is used to calculate the real commodity price.

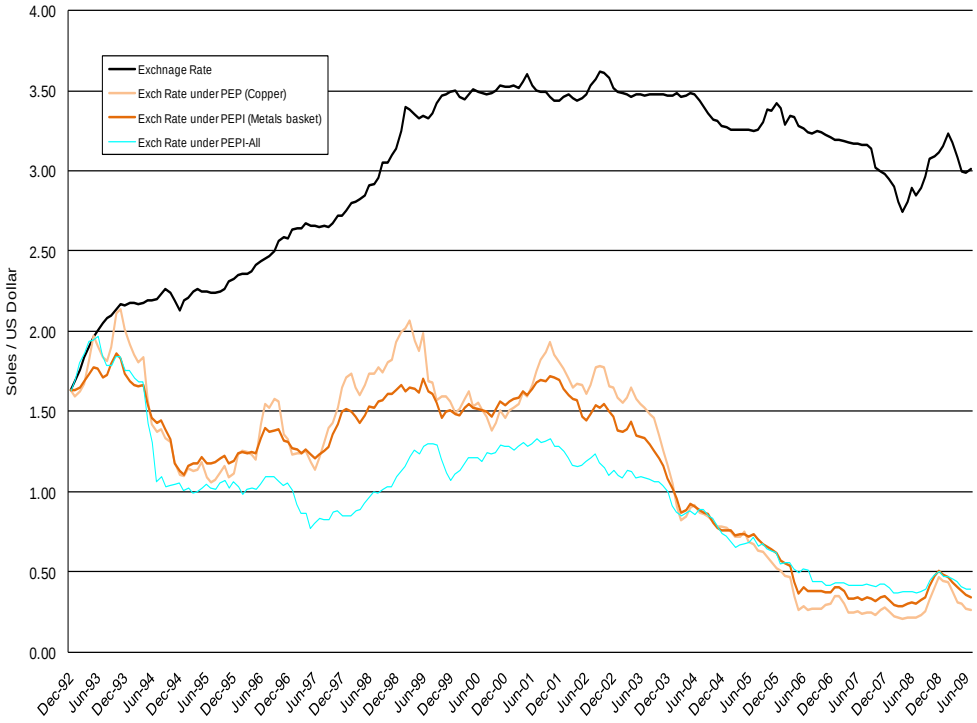
[53] The main inflation forecasting model of the central bank uses an accumulation response of 0.15 percentage point within a year.

7.4 Simulations

7.4.1 Peg to Nominal Commodity Prices

Initially, I calculate the new exchange rate series for the three specifications: Figure 7.3 shows that the increase of commodity prices in 1994-95 would have caused the exchange rate to appreciate with a subsequent depreciation until the end of the 1990s; while, in actual fact, the effective nominal exchange rate has depreciated constantly until the new millennium.

Figure 7.3: Comparison of the nominal exchange rate with the three exchange rate proposals (1993-2009)



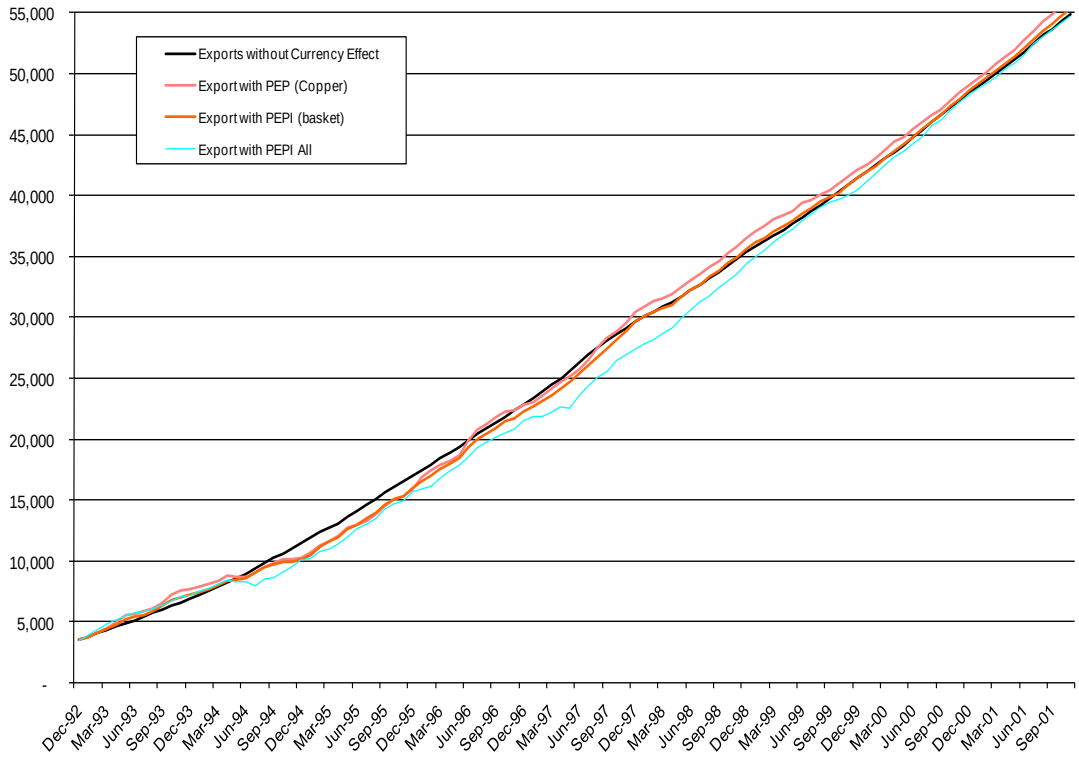
Source: IMF (2011) and author's calculations

Figure 7.3 shows that with the 2003-2008 boom the exchange rate should have appreciated proportionally to levels below 0.5 nuevos soles/US dollar.

Finally, from the figure above it is clear that the three specifications offer similar results: the exchange rate pegged only to the copper price (PEP Copper) would

be more volatile than a peg to the metal basket (PEP Metal basket). The main difference with the third simulation (PEPI All) is of a stronger appreciation at the beginning of the series, given the increase in coffee and fish prices in the early 1990s. Broader diversification translates in lower volatility of the exchange rate.

Figure 7.4: Comparison of the cumulative export revenues with the three exchange rate proposals (Millions US$) (1993-2001)

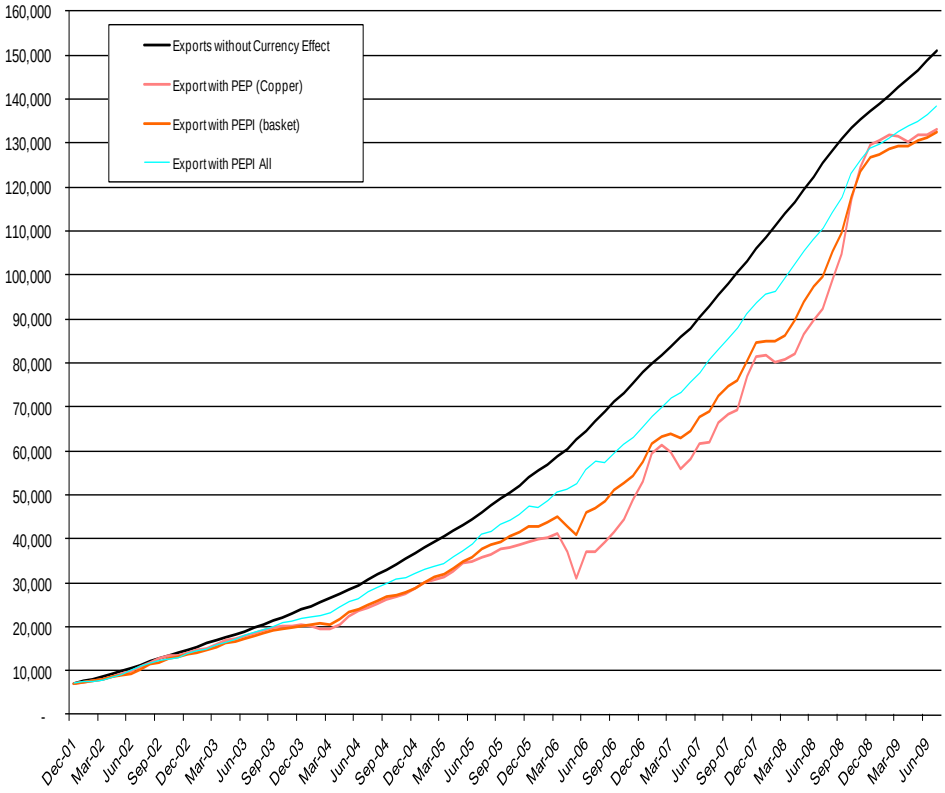


Source: IMF (2011) and author's calculations

Figure 7.4 compares the export revenues under the three simulations: it is evident that given the relatively low volatility of commodity prices in the 1990s, revenues are more stable and closer to the export revenues calculated net of the currency effect. They are just lower when commodity prices increase (given that the exchange rate would appreciate) and they are higher when commodity prices decrease in late 1990s. The PEPI All specification shows the largest effect given the increase of the prices of the two commodities, fish and coffee as

highlighted above, relatively to the metal ones in the early 1990s. The exchange rate of the PEPI All is the one that appreciates the most (Figure 7.5).

Figure 7.5: Comparison of the cumulative export revenues with the three exchange rate proposals (Millions US$) (2002-2009)



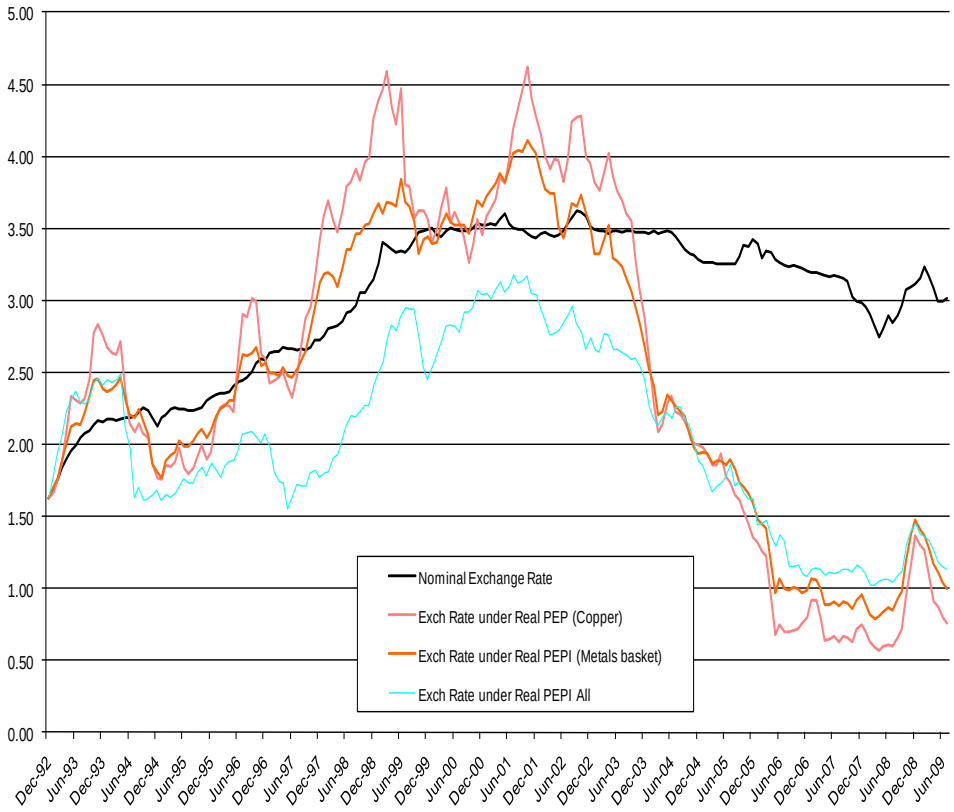
Source: IMF (2011) and author's calculations

Figure 2.5 shows how the boom of commodity prices had a stronger effect on revenues. The higher increase of the copper price relative to the other commodities has the effect of a stronger reduction in revenues (see PEP Copper). The more diversified specification (PEPI All) has less effect since at the boom has been much stronger in metals in general, and in copper in particular.

7.4.2 PEP to Real Prices

If one considers the real commodity prices, instead of nominal prices, it is evident, from the Figure 7.6, that the pegged exchange rate would have been closer to the nominal exchange rate until the beginning of the commodity boom. This shows that, in an economy in which commodity exports are dominant and with other foreign flows irrelevant (i.e. capital flows), the exchange rate has been traded around fair values until the structural break modified its equilibrium level because of the rapid increase of commodity prices, the excess of world liquidity just before the sub-prime crisis.

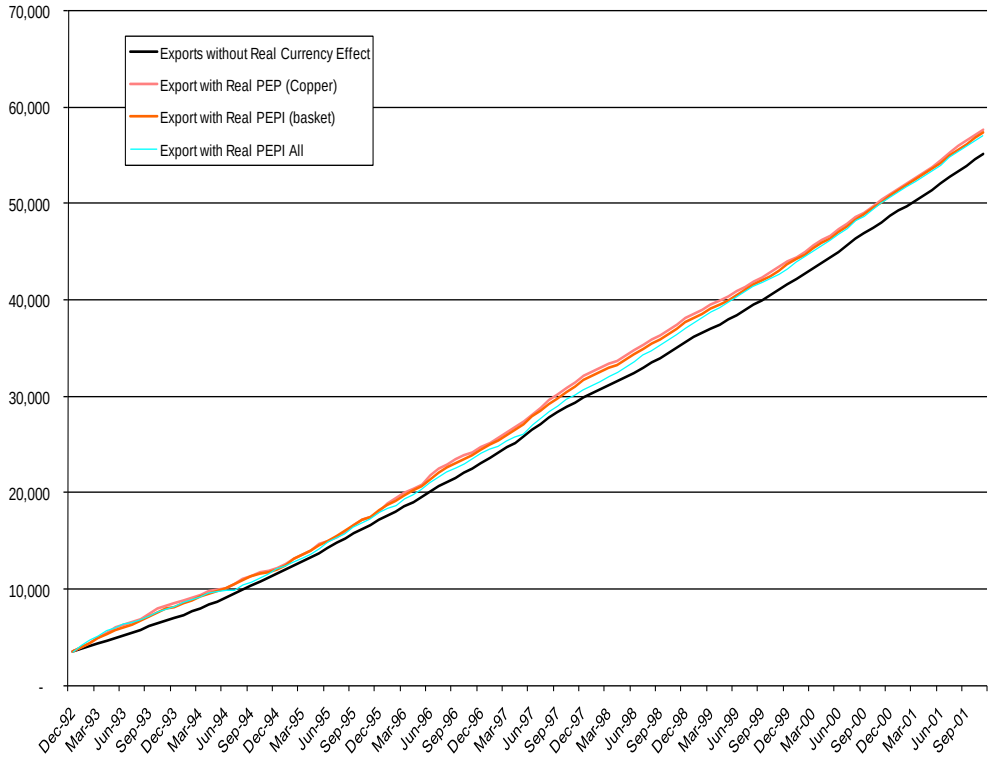
Figure 7.6 Three exchange rate proposals under peg to real commodity prices versus nominal exchange rate (1993-2009)



Source: IMF (2011) and author's calculations

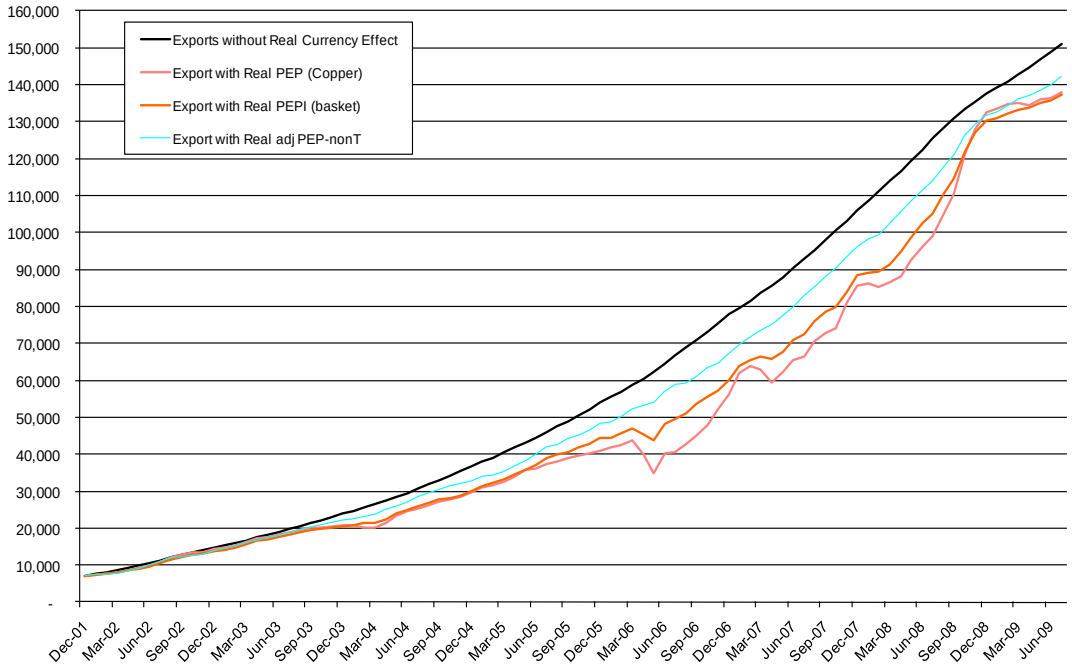
The effects on export revenues lead to considerations similar to the nominal case for both periods.

Figure 7.7: Comparison of the cumulative export revenues with the three exchange rate proposals (Millions US$) (1993-2001)



Source: IMF (2011) and author's calculations

Figure 7.8: Comparison of the cumulative export revenues with the three exchange rate proposals (Millions US$) (2002-2009)



Source: IMF (2011) and author's calculations

7.5 Additional considerations

From the above discussion, it is clear that there is a sudden bifurcation between the nominal exchange rate and the exchange rates under the real peg during the commodity boom. Since commodity revenues are the main source of foreign exchange, one wonders why the actual nominal exchange rate did not follow the appreciation during the commodity boom. Two reasons may explain this puzzle (neither of which are considered in Frankel's framework): firstly, by looking at the balance-of-payments, the more commodity exports increase during the boom, the more profits are repatriated abroad given that most of the mining sector is owned by foreign capital (Table 7.3).

Table 7.3 Balance of payments analysis (Millions of US$) (2001-08)

	2001	2002	2003	2004	2005	2006	2007	2008
GOODS EXPORTS (F.O.B.)	7025.7	7713.9	9090.7	12809.2	17367.7	23800.0	27955.6	31529.4
GOODS IMPORTS(F.O.B)	-7204.5	-7392.8	-8204.9	-9804.8	-12081.6	-14866.0	-19599.2	-28438.9
TRADE BALANCE	-178.7	321.1	885.9	***3004.4***	***5286.1***	***8934.0***	***8356.4***	3090.5
SERVICES: CREDIT	1437.3	1455.0	1715.6	1993.3	2289.2	2647.1	3342.6	3636.5
SERVICES: DEBIT	-2400.1	-2448.8	-2615.5	-2725.1	-3123.5	-3428.5	-4270.4	-5565.8
BALANCE AFTER GOODS AND SERVICES	-1141.5	-672.7	-14.1	2272.6	4451.8	8152.6	7428.7	1161.1
INCOME: CREDIT	670.4	370.2	322.0	331.6	624.9	1033.5	1567.0	1813.7
INCOME: DEBIT	-1771.4	-1827.3	-2465.8	***-4017.5***	***-5701.1***	***-8616.0***	***-9985.1***	-9957.7
Private Sector (BCRP)	675.0	805.0	1367.0	2844.0	4420.0	7276.0	8535.0	8705.0
Profit	131.0	479.0	1112.0	*2567.0*	*4030.0*	*6741.0*	*7788.0*	7687.0
Interest Obligations	544.0	326.0	255.0	277.0	390.0	535.0	747.0	1018.0
Public Sector (BCRP)	1096.0	1022.0	1099.0	1173.0	1282.0	1345.0	1406.0	1253.0
BALANCE AFTER GOODS, SERV. & INC.	-2242.5	-2129.7	-2157.9	-1413.3	-624.3	570.1	-989.5	-6982.9
NET DIR. INVEST. IN REP. ECON.	1069.9	2155.8	1275.0	1599.0	2578.7	3466.5	5342.6	4079.2
PORTFOLIO INVESTMENT ASSETS	-317.9	-316.0	-1286.9	-424.8	-817.0	-1991.9	-519.5	956.6
PORTFOLIO INVESTMENT LIAB.	-54.0	1724.3	1210.5	1244.4	2578.7	155.3	3954.5	-1.0
OTHER INVESTMENT ASSETS	664.5	0.2	127.5	13.7	-1083.8	7.7	-29.6	1665.3
OTHER INVESTMENT LIAB.	171.5	-1581.4	-505.9	-146.4	-3232.9	-541.5	546.0	1015.6
FINANCIAL ACCOUNT	1533.9	1982.8	820.2	2285.9	23.8	1096.1	**9294.0**	**7715.6**

Source: Author's calculation on IMF (2011) and BCRP (2011) where specified

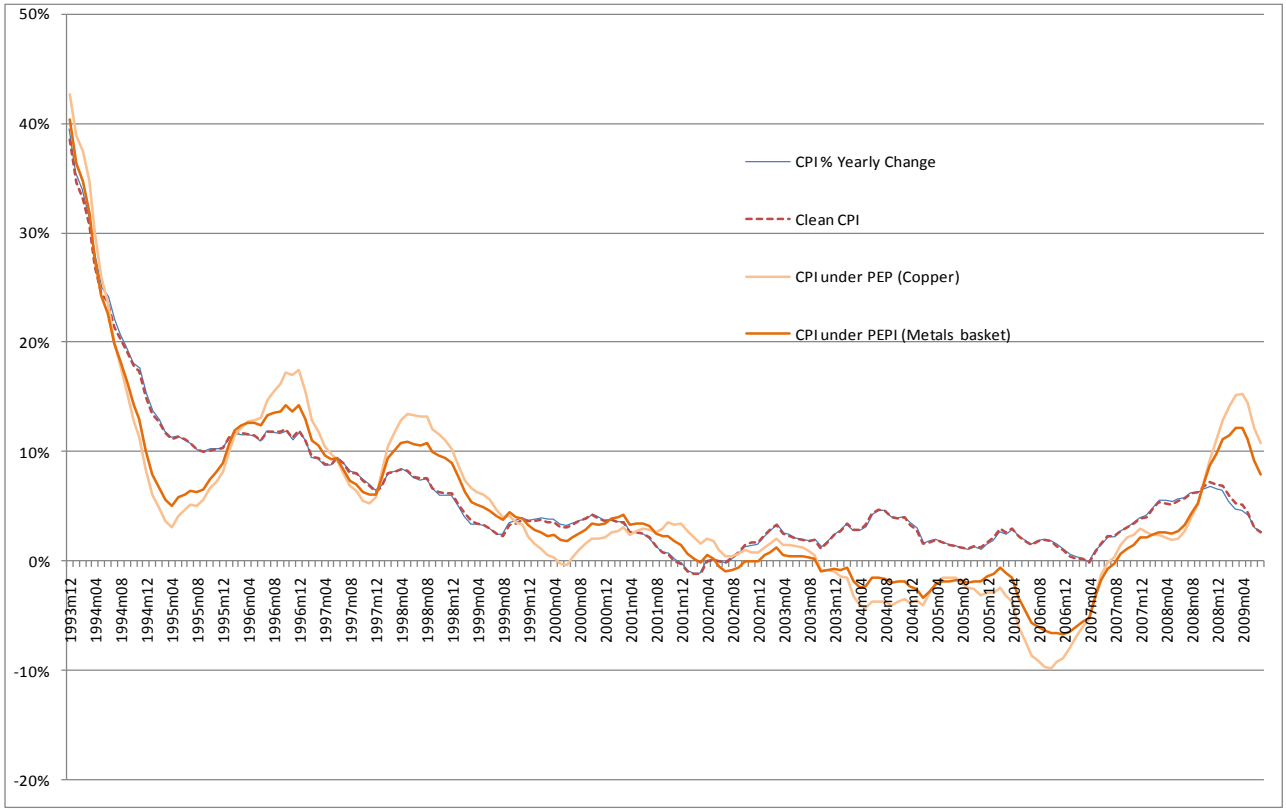
Second, a quite significant intervention in the foreign market to avoid appreciation happened in reflection to the financial account movements when in 2007 both portfolio and direct investment have been as strong as the trade balance. The central bank also intervened in the opposite way in 2008 when, given the burst of the crisis, there was a sudden freeze of portfolio investments and a significant drop of commodity prices. This is also neglected in Frankel's proposal which tends to dismiss the financial account (Frankel 2003; 2006).

Finally, and most importantly, Frankel does not consider the impact of his proposal on inflation which is crucial given the priority of price stability of central banks (Frankel 2003; 2006).

Figure 7.9 shows the yearly changes in inflation since the Central Bank of Peru managed to control inflation at the beginning of 1990s. The clean CPI, the CPI without the

effects of exchange rate fluctuation, results are almost identical to the official CPI given the relative low volatility of the nuevos soles and modest pass-through. On the contrary, Frankel's proposal has a significant impact: for example, the appreciation induced by the latest commodity boom would have dragged the economy into significant deflation if one considers either the PEP (Copper) or PEPI (Metal Basket) nominal specifications. To avoid confusion, the third specification is not shown given that it would be very similar to the other two.

Figure 7.9: Consumer price inflation for different exchange rate simulations, yearly changes (1993-2010)



Source: IMF (2011) and author's calculations

It is clear that, given the more volatile exchange rate under a peg proposal, inflation would partially reflect such volatility offsetting central bank efforts towards price stabilisation.

In the table below (Table 7.4), the volatility of the nominal exchange rates and the three alternative proposals in their nominal version are reported. The volatility of PEP and PEPI is much higher if one considers the second period (Jan 2000 – July 2009) post-depreciation of the 1990s in which macro stability has been achieved and the new inflation targeting monetary framework adopted. This result is similar to Setser's (2007) who applied PEP to oil for Saudi Arabia.

Table 7.4 Volatility of nominal exchange rates (standard deviations)

	Nominal Rate	PEP Copper	PEPI Metal Basket	PEPI All
Dec 92 - July 09	0.515	0.576	0.486	0.386
Jan 00 - July 09	0.206	0.599	0.516	0.347

Source: author's calculations

7.7 Conclusions

The RER solution was preferred to Frankel' proposal (2003; 2006) because of its developmental characteristics, as discussed in chapter 2 of the thesis. However, chapter 6 empirically showed that a managed RER exchange rate proposition is unsuccessful. Consequently, this chapter empirically investigates the second proposal, Frankel' PEP (2003), through a simulation analysis for Peru.

However, this chapter confirmed empirically the limitations anticipated at a theoretical level in chapter 2: in particular, besides the advantages of stabilising commodity revenues, negative repercussions on the other sectors are a major concern. From a macroeconomic perspective, inflation may become unstable while capital flows may be disruptive since they are not accounted for in the model.

Chapter 8 –Conclusions

8.1 Introduction

This dissertation has presented a detailed study of the problems faced by a commodity dependent developing country (CDDC) with a specific analysis of Peru. It focused particularly on the inability of mainstream theoretical and policy paradigms to tackle the specific issues of CDDCs and to interpret the effects of recent changes in the international financial markets on the monetary policy autonomy of these countries.

Furthermore, various exchange rate policy proposals have been assessed in terms of their effects on the real economy, which have been investigated by various quantitative and qualitative methods of analysis. The results have been frustrating since it seems that the exchange rate, alone, is not able to deliver what it promises.

This chapter consists of four sections. Apart from this introduction, the second section summarises the dissertation chapter by chapter and concludes by re-assessing the research questions and hypotheses sketched in the introduction. The third section concentrates on both theoretical and policy implications of this research and, finally, the last section concludes with future avenues for research.

8.2 Research summary

This dissertation was divided in eight chapters. After an overview of the subject matter, a concise summary of the motivation, main contribution, research questions and structure of the thesis presented in the introductory chapter, chapter 2 presented a critical review of the literature concerning the specific monetary issues faced by CDDCs. After a brief historical overview of the literature on the stabilisation of the commodity prices, the chapter reviewed the two most recent monetary policy paradigms, namely the monetarist one and the New Keynesian one. Following the Post-Keynesian critique, these mainstream models, even if adapted to account for dollarisation, a problem typically faced by a Latin-American CDDC, are shown to be inadequate to tackle the issues of a small open economy.

Finally, the chapter gave an original representation of two alternative policy paradigms, RER and PEP, in equation form in order to show their similarities.

Stemming from the critical review of the literature presented in the previous chapter, chapter 3 outlined an alternative analytical framework for the analysis of the business cycle of a CDDC and the transmission mechanism of monetary policy. More specifically, the chapter addressed two issues that are left unresolved by mainstream theory. Firstly, a new theoretical framework is needed to explain the price fluctuations associated to the latest commodity boom. The Minskyan framework of the evolution of capitalism in different forms was adopted. Secondly, a Post-Keynesian approach was used to analyse dollarisation: two forms of liquidity were defined to describe the monetary policy in a partially dollarised economy. Finally, the chapter outlined the channels by which the real exchange rate can affect the economy. In particular, three channels are identified. Adapting Minsky's Financial Instability Hypothesis to CDDCs, the chapter provided an analytical framework to focus on the finance channel determined by the effects of exchange rate fluctuations on firms' balance sheets.

Before moving to the empirical chapters of the thesis (chapters 5-7), chapter 4 described the methods of investigations. The flow of funds analysis used in chapter 5 was described as a system of national accounts designed to bring the financial activities of an economy into explicit relationship with one another and into direct relation to the non-financial activities that generate production and income. The chapter also described the mixed-method approach used in chapter 6 to identify the effect of the Peruvian exchange rate policy on non-financial firms. Finally, a discussion about the data used in the thesis closed the chapter.

Chapter 5 is the first of the three empirical chapters of the thesis. It contextualised the Peruvian monetary policy in historical terms, with a particular focus on the issues of dollarisation and inflation stabilisation. The chapter showed how the Central Bank of Peru followed the consensus on monetary policy shifting from the monetarist to the New Keynesian framework. Given the dramatic changes that the Peruvian economy experienced throughout the period (i.e. hyperinflation, opening of trading and capital accounts, currency flights), the flow of funds analysis validated the theoretical conjectures derived in chapter 3 and the Peruvian monetary policy was explained applying the two forms of liquidity defined in the theoretical chapter.

Chapter 6 presented the empirical finding related to the effects of the Peruvian exchange rate policy for non-financial firms listed at the stock exchange in Lima. The chapter combined two types of analyses. First, it identified the effects of both depreciations and appreciations of the Peruvian currency on firms' investments. Second, it presented a qualitative analysis derived by a database I created by investigating the firms' capital structure according to three types of categorisation of the data set: analysis of different activities by sectors, analysis of the tradables and non-tradables sectors, and analysis of different types of ownerships (conglomerates, multinationals, smaller private, mixed state-private). Given the policy changes Peru experienced during the period under consideration, the last section analysed the structural development of the Peruvian economy and found that this had not changed.

Chapter 7 closed the circle in terms of alternative exchange rate solutions for CDDCs by simulating, for Peru, two different proposals. Both Peg the Export Price (PEP) and the Peg the Export Price Index (PEPI) were analysed in both nominal and real terms. The disappointing results, as anticipated in the literature review, led to the re-assessment of the exchange rate as an actual developmental tool for commodity dependent countries.

Finally, the present chapter summarises the thesis and outlines theoretical and policy implications in the next section, and avenues for future research in the final section.

In terms of research questions, the thesis has shown that neither the monetarist nor the New Keynesian theoretical and policy paradigms were able to address the issues of the CDDCs. This is because they were theoretically very similar both in general terms and in terms of the adaptation to the issues of a CDDC. Also, there was no actual shift in terms of policy and FX interventions by the central bank.

Additionally, the thesis found that the alternatives to inflation targeting are, at best insufficient to tackle the problems of a country like Peru. This inadequacy has been found in theoretical terms (with respect to RER and PEP) and empirically with a simulation analysis of the PEP.

8.3 Theoretical and policy implications

This section shows how this dissertation has provided a theoretical critique of mainstream, both monetarist and New Keynesian, analytical apparatus to deal with the problems of a primary commodity developing country specifically on dollarisation and on the ability to address the complex international insertion of a small CDDC.

In terms of policy implications, the dissertation has provided a similar critique, since the central bank has not been using the potential of the exchange rate as a developmental policy instrument. To be more specific about the process of development and the particular policies which should foster it, it is necessary to consider that industrial policy does not exist in abstract and should not be generally defined; it should be drawn from the specific economic conditions of the reality under consideration the analysis of which is beyond the scope of this thesis.

The above considerations with respect to commodity dependent developing countries and Peru have to be contextualised within the recent developments of the financialisation of both primary commodity developing countries and internationalisation of currencies. These phenomena have fundamental implications for monetary policy autonomy and macromanagement.

As outlined above, the diversity of the Peruvian monetary policy experience during the last two decades brings the question of the macromanagement to the forefront of the debate. After the international financial turmoil at the end of the 1990s and the beginning of the 2000s, countries with open capital accounts were recommended to adopt inflation targeting. This allegedly new policy framework prescribes a floating exchange rate regime since, it was argued, it would provide a nominal anchor against inflation. However, it would also provide these countries with enough flexibility to adjust to adverse shocks and avoid current account deficits, often experienced during the previous decade of fixed exchange rate regimes (for example in Argentina or Brazil amongst others), and could be used as a monetary policy tool domestically (to this end, for example, Obstfeld and Rogoff, 1995; Frankel, 1999; 2003).

However, this thesis followed the Post-Keynesian critique of the effectiveness of the recent monetary policy paradigm (IT) not only because of its lack of originality in

comparison to the previous monetarist paradigm, but also, originally, because of its inability to conceptualise issues typical of a developing country in general and of primary dependent developing country in particular at a theoretical level (chapter 2). Empirically, in the context of Peru, the adoption of the IT regime has not translated into a substantial change in the management of the exchange rate: the central bank has tended to adopt the same kind of foreign exchange interventions envisaged by the monetarist paradigm adopted in the previous decade. These interventions have been ascribed to the "fear of floating". In the literature, this is said to be due to liability dollarisation, the need to increase competitiveness or high pass-through (Calvo and Reinhart, 2002; Hausmann et al., 2000).

Additionally, neither policy paradigms have been able to address dollarisation. This thesis has shown how dollarisation is difficult to conceptualise within a mainstream theoretical apparatus and has provided an alternative framework to analyse it. This new framework stems from a different idea of money within the Post-Keynesian tradition: dollarisation is better considered in its multidimensional nature. The analytical framework presented in this thesis was able to show only two of these dimensions, external and internal, along which, empirically, dollarisation was shown to have been persistent during the last two decades.

The persistence of dollarisation has to be read in conjunction with the fact that, empirically, neither policy paradigm seemed to have been able to address it: this may have been because the two frameworks were not very dissimilar and because the kinds of intervention that the central bank implemented remained essentially the same. However, the empirical investigation of the thesis shows that dollarisation may be reduced when the structure of the economy is diversified away from primary commodity production.

In terms of the implementation of inflation targeting as a monetary policy paradigm, the amalgamation of the management of the exchange rate within this target is particularly complex (chapter 2): during depreciations, liability dollarisation and high pass-through can endanger the inflation target, while in periods of appreciations, interventions imply sterilisation and hence high domestic interest rates which may attract further (possibly short-term) capital inflows.

However, this dissertation has a specific emphasis on the exchange rate as a real sector developmental tool, with, potentially, important distributional implications across

sectors (tradable vs. non tradable and traditional vs. non-traditional export) and in terms of productive diversification away from primary products towards more value added sectors. Hence, periods of appreciations as well as abrupt depreciations may have detrimental effects on the real economy.

With the above considerations in mind, the thesis has assessed the effects of the two mainstream policy paradigms on the real economy during the last two decades by implementing a flows of funds analysis in relation to the specific issue of dollarisation (both in chapter 5), and in terms of various sectors and types of ownership (chapter 6). It then addressed various alternatives to mainstream policy paradigms at theoretical level (chapter 2) and with empirical simulations (chapter 7).

The RER target has been found to be the one with highest developmental implications in comparison to PEP which stabilises commodity revenues in countercyclical fashion. However, the empirical simulation of the PEP in chapter 7 reveals that, as suggested by the theory, it may have negative repercussions on the other sectors of the economy and difficulties in controlling inflation. Overall, however, the thesis concludes that the exchange rate solution is a myth: the objectives that the various exchange rate policy proposals seek to address, namely economic stability, cannot be pursued by monetary policy alone and may be resolved only by a structural change of the economy. That is, the exchange rate is not sufficient to bring about development.

Moreover, due to space constraint, only a few observations can be made on the work Minsky dedicated to developing countries. The thesis aimed at the conclusion that even the best designed exchange rate regime would be insufficient to bring about development since it becomes ineffective because of the way in which the economy is structured around the presence of large conglomerates: despite central bank' interventions with the aim to stabilise the exchange rate and provide a safe investment environment for the non-traditional sector. This has not been developing in the last two decades. Instead, investment has been channelled in the traditional sector and in the non-tradable sector (because of privatisation in the utility sector and, partially, in construction). As a result, the exchange rate management has been ineffective in pursuing a diversification away from primary commodities that would provide the country with economic stability, let alone, development. It is with these considerations in mind that I considered the policy prescriptions advocated my Minsky decades ago.

In the Kaleckian tradition, Minsky recognised that the problem of "semi-industrialised" countries, as he dubbed Latin American economies (Minsky, 1990), is one of financing: the financial structure should force surplus towards productive channels. The banking function that cannot be escaped in this process is the investment banking which industrialised countries enjoyed in the financing of investment during a recent stage of their development. Commercial capitalism only needed financing for trade and production of goods, while in industrial capitalism investment bankers seek out and finance new and developing industries.

However, there are difficulties for semi-industrialised countries: large corporations in a phase of managerial capitalism do not depend on financial houses for their financing of investment and foreign resources have so far, led to a number of problematic results, as a consequence, internal sources of financing should be developed.

Within this contextualisation, Minsky had a precise idea of the function of the central bank in developing countries: more specifically, first, the central bank should use its discretionary potential in managing the country's foreign balance to support domestic development (hence there should be cooperation between a domestic developmental authority and the central bank). Second, to support the investment banking function which may be lacking within the private sector in developing countries, the central bank should pursue direct intervention into financing activity, which may take the form of the organisation of specialised financial institutions to provide direct credit (Minsky, 1977).

From a more specific monetary policy viewpoint, Minsky addresses a currently debated issue: the problem of bypassing the existing set of financial institutions and directly financing business activity. From a theoretical point of view, this is addressed consistently with his idea of money and credit away from the quantity of money and based on *"the terms upon which financing is available to the units of the economy"* (Minsky, 1977, p. 20). Finally, to avoid inflation risk and trade balance deficits, investment could be financing labour-intensive consumption good sector. Minsky went even further and recommended to that the central bank should be ready to import consumer goods in the economy; it should act as a merchant bank financed through commodity revenues (Minsky, 1977).

A final consideration is necessary: this thesis adopts a Post-Keynesian approach and it is critical of mainstream economics. The approach adopted in this thesis implies a pervasive

industrial policy aimed at the development of the non-traditional export sector. However, whether there are the political economy conditions for an industrial policy that should encourage such a diversification away from primary commodities toward the non-traditional export sector, is a questions overlooked in this approach, as suggested in the second section of Chapter 1. In that section development is defined in terms of the process of moving from a set of assets based on primary products to one based on skills, technology and knowledge, a process in which state intervention plays a crucial role (Amsden, 2001). Throughout the thesis (in the second and third sections of Chapter 5 and in the fourth section of Chapter 6) however, the issue of political economy constraints that could undermine the state's ability to promote the developmental process has been addressed. The empirical chapters have discussed the problematic relations between state and business and have briefly mentioned the analytical framework of the developmental state and its pivotal concept of state autonomy. More generally, the developmental state literature has provided a theoretical support for comparative studies on the successful East Asian policies versus the unsuccessful examples of Latin American countries.

8.4 Avenues for future research

Besides the policy implications presented above, there are at least four main areas relevant for future research.

The first is that the simultaneous integration of Peru in the international financial markets and the financialisation of the primary commodities gives rise to a complex interaction within the balance of payments of a small primary commodity developing economy. The question is very relevant in terms of macroeconomic management. An integrated analysis of these two issues which may interplay in a mutually reinforcing fashion has not been investigated so far.

The second area is how the financialisation and the internationalisation of various currencies (the fact that, increasingly, emerging markets'currencies are traded in financial markets) may, as further determinant of the exchange rate, impact the ability of the central bank to control and influence the exchange rate. To this end, heterodox economics in general and the Post-Keynesian tradition in particular, may fill in gap left within mainstream

literature which, so far, has ignored these recent developments regarding the international insertion of economies in general and the effect on small open economies in particular, also through the integration of the domestic dollar market with the international dollar market.

Third, the introductory chapter has defined development in terms of a movement away from primary commodities towards an economy based on skills, technology and knowledge fostered by pervasive and specifically aimed state intervention in the form of industrial policy. Successful industrial policy experiences seem to have been the result of the fostering of linkages from primary product exports to manufacturing. However, given the necessity to be specific about the process of development and the particular policies which should support it, it is essential to consider that industrial policy does not exist in abstract and should not be generally defined; it should be drawn from the specific economic conditions of the reality under consideration. As a result, an analysis of the activities that could maximise linkages from primary product exports to manufacturing would give a more accurate policy indication than the one provided in this thesis.

Finally, a future research should address what this dissertation has only started to consider: the introduction stated that this thesis has been motivated by the consideration that, especially for a small primary commodity dependent developing economy, exchange rate dynamics have a considerable impact on the real economy in terms of growth, employment and distribution of income and wealth. A recent research into these themes that accounts for the recent developments (in terms of financialisation of both the primary commodities and the domestic currency) has not been developed as of yet. Some studies have investigated the impact of the exchange rate on growth and employment but these analyses have not gone far as to analyse the implications in terms of distribution.

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Appendices

Appendix A

Appendix A presents the balance sheet matrices for the Peruvian economy from 1985 to 2010. As shown in chapter 4, the objective of this matrix is to show the changes in financial stocks of assets and debts for the Peruvian economy. Specifically, the table here follow the adaptation shown in Table 4.3 in which the public sector is formed by the central bank and the government sectors, the private sector is formed by the banking system and the non-banking system, and the rest of the world. Additionally, matrices show private credit, money and quasi-money in both domestic and foreign currencies in order to take into account of the partial dollarisation of the economy. All data are presented as a percentage of GDP.

Table A1: Flow of funds analysis for the year 1985 (percentage of GDP) (Source: IMF, BCRP)

1985	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		-4.0		3.6	0.5
Net Foreign Claims	9.9	5.0	8.8	-2.4	-21.4
Net Domestic Debt	-1.2	8.5	-0.1		-7.1
Net Private Credit	3.8	0.0	15.2	-23.9	4.9
Peruvian soles	*3.8*	*0.0*	*9.5*	*-13.2*	*0.0*
US$			*5.7*	*-10.6*	*4.9*
Money and Quasi-Money	-15.6		-21.7	37.3	0.0
Peruvian soles	*-11.7*		*-14.7*	*26.4*	*0.0*
US$	*-3.9*		*-7.0*	*10.9*	*0.0*

Table A2: Flow of funds analysis for the year 1986 (percentage of GDP) (Source: IMF, BCRP)

1986	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		-7.4		0.5	6.9
Net Foreign Claims	3.3	4.5	3.0	-1.5	-9.3
Net Domestic Debt	0.4	10.2	2.2		-12.8
Net Private Credit	4.0	0.0	13.4	-17.5	0.1
Peruvian soles	*4.0*	*0.0*	*10.4*	*-14.4*	*0.0*
US$			*3.0*	*-3.1*	*0.1*
Money and Quasi-Money	-11.4		-17.6	29.0	0.0
Peruvian soles	*-10.3*		*-15.3*	*25.6*	*0.0*
US$	*-1.1*		*-2.3*	*3.3*	*0.0*

Table A3: Flow of funds analysis for the year 1987 (percentage of GDP) (Source: IMF, BCRP)

1987	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		-9.8		2.5	7.4
Net Foreign Claims	0.0	4.2	0.2	-0.9	-3.4
Net Domestic Debt	3.2	13.6	5.8		-22.7
Net Private Credit	5.2	0.0	13.5	-20.3	1.5
Peruvian soles	*5.2*	*0.0*	*10.5*	*-15.8*	*0.0*
US$			*3.0*	*-4.5*	*1.5*
Money and Quasi-Money	-12.2		-18.8	31.0	0.0
Peruvian soles	*-11.0*		*-16.6*	*27.6*	*0.0*
US$	*-1.3*		*-2.2*	*3.4*	*0.0*

Table A4: Flow of funds analysis for the year 1988 (percentage of GDP) (Source: IMF, BCRP)

1988	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		-11.3		3.4	8.0
Net Foreign Claims	-4.6	6.0	-3.8	-1.2	3.5
Net Domestic Debt	-2.2	17.8	3.6		-19.1
Net Private Credit	6.3	0.0	13.5	-22.5	2.7
Peruvian soles	*6.3*	*0.0*	*7.4*	*-13.6*	*0.0*
US$			*6.1*	*-8.9*	*2.7*
Money and Quasi-Money	-14.7		-22.9	37.6	0.0
Peruvian soles	*-9.8*		*-14.8*	*24.6*	*0.0*
US$	*-5.0*		*-8.0*	*13.0*	*0.0*

Table A5: Flow of funds analysis for the year 1989 (percentage of GDP) (Source: IMF, BCRP)

1989	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		-10.9		8.7	2.3
Net Foreign Claims	1.6	3.9	2.9	-1.0	-7.4
Net Domestic Debt	-1.0	10.6	3.0		-14.8
Net Private Credit	6.4	0.0	10.9	-19.0	1.8
Peruvian soles	*6.4*	*0.0*	*7.2*	*-13.5*	*0.0*
US$			*3.7*	*-5.5*	*1.8*
Money and Quasi-Money	-9.2		-20.0	29.2	0.0
Peruvian soles	*-7.6*		*-15.3*	*22.9*	*0.0*
US$	*-1.6*		*-4.7*	*6.3*	*0.0*

Table A6: Flow of funds analysis for the year 1990 (percentage of GDP) (Source: IMF, BCRP)

1990	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		-8.7		3.9	4.9
Net Foreign Claims	4.6	2.0	6.8	-1.0	-12.5
Net Domestic Debt	-2.4	13.3	3.1		-14.0
Net Private Credit	3.9	0.0	11.8	-14.5	-1.2
Peruvian soles	*3.9*	*0.0*	*5.6*	*-9.5*	*0.0*
US$			*6.2*	*-5.1*	*-1.2*
Money and Quasi-Money	-11.1		-20.1	31.2	0.0
Peruvian soles	*-7.8*		*-10.7*	*18.5*	*0.0*
US$	*-3.3*		*-9.4*	*12.8*	*0.0*

Table A7: Flow of funds analysis for the year 1991 (percentage of GDP) (Source: IMF, BCRP)

1991	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		-2.8		-1.7	4.5
Net Foreign Claims	4.4	-0.1	6.8	-0.5	-10.6
Net Domestic Debt	-0.6	5.1	-0.1		-7.1
Net Private Credit	1.0	0.0	9.3	-10.0	-0.2
Peruvian soles	*1.0*	*0.0*	*3.6*	*-4.6*	*0.0*
US$			*5.6*	*-5.4*	*-0.2*
Money and Quasi-Money	-6.2		-14.4	20.6	0.0
Peruvian soles	*-3.1*		*-5.8*	*8.9*	*0.0*
US$	*-3.1*		*-8.6*	*11.7*	*0.0*

Table A8: Flow of funds analysis for the year 1992 (percentage of GDP) (Source: IMF, BCRP)

1992	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		-3.4		-1.9	5.3
Net Foreign Claims	7.0	0.9	8.8	-0.5	-16.1
Net Domestic Debt	-0.9	6.9	-0.9		-5.7
Net Private Credit	0.8	0.2	10.8	-8.6	-2.9
Peruvian soles	*0.8*	*0.2*	*3.2*	*-4.0*	*-0.2*
US$			*7.6*	*-4.6*	*-3.0*
Money and Quasi-Money	-7.4		-15.6	23.1	0.0
Peruvian soles	*-3.0*		*-5.5*	*8.5*	*0.0*
US$	*-4.4*		*-10.2*	*14.6*	*0.0*

Table A9: Flow of funds analysis for the year 1993 (percentage of GDP) (Source: IMF, BCRP)

1993	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		-2.5		-4.6	7.1
Net Foreign Claims	8.5	-0.8	9.2	-1.4	-15.5
Net Domestic Debt	-0.9	5.4	-1.2		-3.2
Net Private Credit	0.5	0.4	12.2	-8.2	-4.1
Peruvian soles	*0.5*	*0.4*	*2.9*	*-3.4*	*-0.4*
US$			*9.3*	*-4.7*	*-4.6*
Money and Quasi-Money	-7.7		-17.3	24.9	0.0
Peruvian soles	*-2.6*		*-5.3*	*8.0*	*0.0*
US$	*-5.1*		*-11.9*	*17.0*	*0.0*

Table A10: Flow of funds analysis for the year 1994 (percentage of GDP) (Source: IMF, BCRP)

1994	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		-1.9		-4.2	6.1
Net Foreign Claims	12.6	1.0	13.4	-2.6	-24.4
Net Domestic Debt	-3.7	8.1	-5.9		1.5
Net Private Credit	-0.2	5.1	14.0	0.5	-9.2
Peruvian soles	*-0.2*	*5.1*	*3.7*	*-3.5*	*-5.1*
US$			*10.3*	*4.0*	*-14.3*
Money and Quasi-Money	-7.9		-18.0	25.9	0.0
Peruvian soles	*-3.1*		*-6.5*	*9.5*	*0.0*
US$	*-4.8*		*-11.6*	*16.4*	*0.0*

Table A11: Flow of funds analysis for the year 1995 (percentage of GDP) (Source: IMF, BCRP)

1995	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		-2.4		-6.2	8.6
Net Foreign Claims	12.7	0.3	12.7	-2.4	-23.3
Net Domestic Debt	-4.0	11.6	-6.5		-1.0
Net Private Credit	-0.1	1.8	16.2	-7.1	-7.3
Peruvian soles	*-0.1*	*1.8*	*4.7*	*-4.6*	*-1.8*
US$			*11.5*	*-2.4*	*-9.1*
Money and Quasi-Money	-8.4		-18.7	27.1	0.0
Peruvian soles	*-3.4*		*-7.0*	*10.4*	*0.0*
US$	*-5.0*		*-11.7*	*16.7*	*0.0*

Table A12: Flow of funds analysis for the year 1996 (percentage of GDP) (Source: IMF, BCRP)

1996	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		-0.5		-6.1	6.5
Net Foreign Claims	16.2	0.8	16.7	-2.5	-31.3
Net Domestic Debt	-5.8	15.0	-10.8		1.6
Net Private Credit	-0.8	3.9	21.2	-8.8	-7.7
Peruvian soles	*-0.8*	*3.9*	*5.5*	*-4.7*	*-3.9*
US$			*15.7*	*-4.1*	*-11.6*
Money and Quasi-Money	-9.0		-22.8	31.9	0.0
Peruvian soles	*-3.0*		*-7.5*	*10.5*	*0.0*
US$	*-6.1*		*-15.3*	*21.4*	*0.0*

Table A13: Flow of funds analysis for the year 1997 (percentage of GDP) (Source: IMF, BCRP)

1997	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		0.7		-6.4	5.7
Net Foreign Claims	17.6	-0.8	13.7	-4.9	-25.6
Net Domestic Debt	-6.8	19.5	-10.6		-2.1
Net Private Credit	-0.5	0.9	24.4	-14.0	-9.0
Peruvian soles	*-0.5*	*0.9*	*5.5*	*-5.0*	*-0.9*
US$			*18.9*	*-8.9*	*-9.9*
Money and Quasi-Money	-9.7		-23.5	33.2	0.0
Peruvian soles	*-3.4*		*-8.2*	*11.6*	*0.0*
US$	*-6.3*		*-15.3*	*21.6*	*0.0*

Table A14: Flow of funds analysis for the year 1998 (percentage of GDP) (Source: IMF, BCRP)

1998	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		-0.7		-5.2	5.9
Net Foreign Claims	17.4	0.0	13.7	-7.1	-24.1
Net Domestic Debt	-7.2	22.2	-11.2		-3.8
Net Private Credit	-0.2	0.5	28.0	-24.3	-3.0
Peruvian soles	*-0.2*	*0.5*	*5.6*	*-5.4*	*-0.5*
US$			*22.4*	*-18.9*	*-3.5*
Money and Quasi-Money	-8.8		-24.6	33.4	0.0
Peruvian soles	*-3.2*		*-7.6*	*10.8*	*0.0*
US$	*-5.6*		*-17.0*	*22.6*	*0.0*

Table A15: Flow of funds analysis for the year 1999 (percentage of GDP) (Source: IMF, BCRP)

1999	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		-3.1		0.4	2.7
Net Foreign Claims	17.0	0.2	15.4	-8.5	-24.0
Net Domestic Debt	-5.8	21.9	-9.5		-6.6
Net Private Credit	0.0	0.8	28.5	-27.4	-0.4
Peruvian soles	*0.0*	*0.8*	*5.0*	*-5.1*	*-0.8*
US$			*23.5*	*-22.3*	*-1.1*
Money and Quasi-Money	-9.5		-26.6	36.1	0.0
Peruvian soles	*-3.6*		*-8.1*	*11.7*	*0.0*
US$	*-5.9*		*-18.5*	*24.5*	*0.0*

Table A16: Flow of funds analysis for the year 2000 (percentage of GDP) (Source: IMF, BCRP)

2000	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		-3.2		0.3	2.9
Net Foreign Claims	15.6	-1.3	14.3	-9.3	-19.2
Net Domestic Debt	-5.1	17.3	-7.5		-4.8
Net Private Credit	-0.3	0.8	25.9	-23.5	-1.4
Peruvian soles	*-0.3*	*0.8*	*4.7*	*-4.5*	*-0.8*
US$			*21.1*	*-19.0*	*-2.2*
Money and Quasi-Money	-9.1		-25.5	34.6	0.0
Peruvian soles	*-3.8*		*-7.8*	*11.5*	*0.0*
US$	*-5.3*		*-17.7*	*23.0*	*0.0*

Table A17: Flow of funds analysis for the year 2001 (percentage of GDP) (Source: IMF, BCRP)

2001	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		-2.5		0.3	2.2
Net Foreign Claims	15.8	-0.9	15.5	-9.8	-20.6
Net Domestic Debt	-4.5	15.8	-5.9		-5.4
Net Private Credit	-0.4	0.6	24.3	-21.2	-2.2
Peruvian soles	*-0.4*	*0.6*	*4.8*	*-4.4*	*-0.6*
US$			*19.5*	*-16.8*	*-2.8*
Money and Quasi-Money	-9.7		-26.2	35.8	0.0
Peruvian soles	*-4.2*		*-8.7*	*12.9*	*0.0*
US$	*-5.4*		*-17.5*	*22.9*	*0.0*

Table A18: Flow of funds analysis for the year 2002 (percentage of GDP) (Source: IMF, BCRP)

2002	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		-2.1		0.1	2.0
Net Foreign Claims	17.0	-2.1	17.3	-8.0	-24.3
Net Domestic Debt	-5.1	14.6	-6.0		-3.5
Net Private Credit	-0.4	0.8	23.1	-20.6	-1.3
Peruvian soles	*-0.4*	*0.8*	*4.9*	*-4.4*	*-0.8*
US$			*18.2*	*-16.1*	*-2.1*
Money and Quasi-Money	-9.9		-26.2	36.1	0.0
Peruvian soles	*-4.4*		*-9.1*	*13.5*	*0.0*
US$	*-5.5*		*-17.1*	*22.6*	*0.0*

Table A19: Flow of funds analysis for the year 2003 (percentage of GDP) (Source: IMF, BCRP)

2003	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		-1.6		0.0	1.5
Net Foreign Claims	16.7	-1.3	17.3	-7.1	-25.7
Net Domestic Debt	-4.6	14.0	-5.5		-3.9
Net Private Credit	-0.7	0.1	20.7	-19.9	-0.1
Peruvian soles	*-0.7*	*0.1*	*4.8*	*-4.1*	*-0.1*
US$			*15.9*	*-15.7*	*-0.2*
Money and Quasi-Money	-9.9		-24.9	34.9	0.0
Peruvian soles	*-5.4*		*-9.5*	*14.9*	*0.0*
US$	*-4.5*		*-15.5*	*20.0*	*0.0*

Table A20: Flow of funds analysis for the year 2004 (percentage of GDP) (Source: IMF, BCRP)

2004	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		-1.0		1.0	0.0
Net Foreign Claims	17.4	-1.5	17.6	-5.7	-27.8
Net Domestic Debt	-4.4	12.5	-5.9		-2.2
Net Private Credit	-0.8	0.2	18.4	-15.7	-1.7
Peruvian soles	*-0.8*	*0.2*	*4.8*	*-4.0*	*-0.2*
US$			*13.6*	*-11.7*	*-1.8*
Money and Quasi-Money	-11.3		-24.0	35.3	0.0
Peruvian soles	*-7.3*		*-10.8*	*18.1*	*0.0*
US$	*-4.0*		*-13.2*	*17.2*	*0.0*

Table A21: Flow of funds analysis for the year 2005 (percentage of GDP) (Source: IMF, BCRP)

2005	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		-0.4		1.8	-1.4
Net Foreign Claims	18.5	1.6	18.6	-4.0	-34.6
Net Domestic Debt	-3.7	13.9	-5.8		-4.4
Net Private Credit	-0.4	0.1	19.4	-16.9	-2.0
Peruvian soles	*-0.4*	*0.1*	*5.9*	*-5.4*	*-0.1*
US$			*13.5*	*-11.5*	*-2.1*
Money and Quasi-Money	-13.3		-25.8	39.1	0.0
Peruvian soles	*-7.8*		*-11.7*	*19.5*	*0.0*
US$	*-5.4*		*-14.1*	*19.5*	*0.0*

Table A22: Flow of funds analysis for the year 2006 (percentage of GDP) (Source: IMF, BCRP)

2006	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		2.4		0.7	-3.1
Net Foreign Claims	18.3	0.6	19.1	-3.9	-34.1
Net Domestic Debt	-4.3	11.3	-7.1		0.1
Net Private Credit	-2.2	0.1	17.8	-14.4	-1.2
Peruvian soles	*-2.2*	*0.1*	*6.6*	*-4.4*	*-0.1*
US$			*11.3*	*-10.0*	*-1.3*
Money and Quasi-Money	-10.8		-24.3	35.2	0.0
Peruvian soles	*-7.2*		*-12.0*	*19.2*	*0.0*
US$	*-3.6*		*-12.4*	*16.0*	*0.0*

Table A23: Flow of funds analysis for the year 2007 (percentage of GDP) (Source: IMF, BCRP)

2007	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		3.1		-1.7	-1.4
Net Foreign Claims	24.0	2.0	21.5	-6.1	-41.3
Net Domestic Debt	-5.2	15.8	-10.3		-0.3
Net Private Credit	-3.4	0.1	21.0	-7.4	-10.1
Peruvian soles	*-3.4*	*0.1*	*8.4*	*-5.1*	*-0.1*
US$			*12.6*	*-2.3*	*-10.3*
Money and Quasi-Money	-14.5		-26.9	41.4	0.0
Peruvian soles	*-10.6*		*-14.5*	*25.0*	*0.0*
US$	*-4.0*		*-12.4*	*16.4*	*0.0*

Table A24: Flow of funds analysis for the year 2008 (percentage of GDP) (Source: IMF, BCRP)

2008	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		2.4		-6.6	4.2
Net Foreign Claims	25.7	1.0	23.4	-7.2	-42.8
Net Domestic Debt	-6.6	18.2	-11.4		-0.2
Net Private Credit	-1.4	0.0	25.1	-15.7	-7.9
Peruvian soles	*-1.4*	*0.0*	*11.2*	*-9.7*	*0.0*
US$			*13.9*	*-5.9*	*-8.0*
Money and Quasi-Money	-15.5		-30.3	45.8	0.0
Peruvian soles	*-10.2*		*-16.0*	*26.3*	*0.0*
US$	*-5.3*		*-14.2*	*19.5*	*0.0*

Table A25: Flow of funds analysis for the year 2009 (percentage of GDP) (Source: IMF, BCRP)

2009	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		-0.9		1.1	-0.2
Net Foreign Claims	25.0	-1.0	23.6	-8.2	-39.5
Net Domestic Debt	-6.6	19.8	-10.4		-2.8
Net Private Credit	-2.5	0.0	24.8	-21.9	-0.4
Peruvian soles	*-2.5*	*0.0*	*12.2*	*-9.7*	*0.0*
US$			*12.6*	*-12.2*	*-0.4*
Money and Quasi-Money	-14.1		-31.2	45.3	0.0
Peruvian soles	*-9.9*		*-17.4*	*27.3*	*0.0*
US$	*-4.2*		*-13.8*	*18.0*	*0.0*

Table A26: Flow of funds analysis for the year 2010 (percentage of GDP) (Source: IMF, BCRP)

2010	Public Sector		Private Sector		Rest of the World
	Central Bank	Government	Banks	F& H	
Net Lending		-0.1		-1.4	1.5
Net Foreign Claims	28.5	0.5	25.2	-9.3	-44.9
Net Domestic Debt	-7.0	19.9	-10.2		-2.8
Net Private Credit	-2.3	0.1	24.8	-13.6	-8.8
Peruvian soles	*-2.3*	*0.1*	*12.7*	*-10.4*	*-0.1*
US$			*12.1*	*-3.1*	*-8.9*
Money and Quasi-Money	-18.0		-33.7	51.8	0.0
Peruvian soles	*-13.7*		*-20.6*	*34.2*	*0.0*
US$	*-4.4*		*-13.2*	*17.5*	*0.0*

Appendix B

Database B

Name	Sector	Size – Empl.	History	Corporate Actions	Conasev ownership history	Owner detail	Ownership Classification
AGRO INDUSTRIAL PARAMONGA S.A.A. Y SUBSIDIARIAS	Agribusiness	1000	Founded in 1970,. In 1994 changed from Cooperativa to SA.		RIO PATIVILCA S.A	In 1996 Barroco Sa (Kimberly SA) through Rio Pativilca SA) buys it.	Foreign Conglomerate from 1996
AGRO PUCALA S.A.A.	Agribusiness	2400	Founded in 1970 as Cooperativa.		CROMWELL ASSETS S.A. (51%, Virgin Isl.)	Cromwell Assets SA	Foreign Firm from 1999
AGRO-INDUSTRIAS SAN JACINTO S.A.A.	Agribusiness	900 to 1300	Founded in 1992 as SA	In 2000 includes subsidiary Compania Peruana de Azucar. In 2001, merger with Valle del Santa SAC	CORPORACION AZUCARERA DEL PERU SOCIEDAD ANONIMA - COAZUCAR DEL PERU S.A. (83%)	Corporacion Azucarera del Peru SA is formed by: Complejo Agroindustrial Cartavio SAA, Empresa Agraria Chiquitoy SA, Empresa Agricola Sintuco SA, Empresa Agroindustrial Casa Grande SAA.	Banda

ALICORP, SOCIEDAD ANONIMA	Commerce	2200	Founded in 1956	Acquisition of Nicolini and Mopesa in Dec. 1996, Alimentum in 2004. In Sept 2005 buys from Colgate Peru SA the Planta de Detergentes (1.3 us mil).In Nov 2005 buys from Industria Pacocha SA the firm Marsella (22.5mil $). In Oct 2006, buys Molinera Inca from Contigroup Companies and Farmington Enterprise Inc. for 17.5 mil USD.. Also buys Asa Alimentos for 20.8 Mil USD. In May 2007, buys Eskimo SA (Ecuador) FOR 8.3 mil USD. In May 2008, buys The Value Brands Company de Argentina S.C.A., TVBC S.C.A., The Value Brands Company de San Juan S.A. and Sulfargén S.A.(Argentina), The Value Brands Company de Perú S.R.L. and The Value Brands Company de Uruguay S.R.L., for US$65,000 mil. In Jult 2008, buys Productos Personales S.A. (Propersa, Colombia) and Downford Corporation for US$1,138.4 mil.	BIRMINGHAM MERCHANT S.A. (11%, Panama), GRUPO PIURANO DE INVERSIONES S.A. (8%), Fondos	Grupo Romero	Romero
ALMACENERA PERUANA DE COMERCIO S.A. - ALPECO	Commerce	20	Founded in 1981		Romero Family (62%), INVERSIONES CENTENARIO S.A.A (25%), MARAY S.A. (10%)	Banco de comercio, later Caja de Pensiones Militar Policial	Romero

ASEA BROWN BOVERI S.A.	Manufacturing (Capital Goods)	200	Founded in 1923	In 1993, it merges with ABBFRE SA (electr.)	ABB-ASEA BROWN BOVERI LTD, SUIZA	Southward Securities (Canada) in 1992, Asea Broown Swiss 1994	Foreign Firm
AUSTRAL GROUP S.A.A. - EN REESTRUCTURACION	Fishing	2200	Founded 1996, called Pesquera Industrial Pacifico SA then Austral Chancay SA , in 1998 called Austral (fusion of Pesquera Austral SA and Pesquera Arco Iris). It owns Metalpack (package), Camposol (Asparagous), Aereo Chavin (flight service) and Minera Volcan.	In 1999, re-structuring debt. In 2004, Octagon Financial Services int LLC buys it. Tomma SAC bought 66.67% and 296ransferred equities to Dordogne Holdings Inc.In 2005, sells Metalpack to Nogat Corp (Panama, 8.825 mil$). In 2008, it buys 50% of Cormar – Corporation de Mar SA.	DORDOGNE HOLDINGS INC. (87%, Panama)	Laco SA (Norway) through Holdings Dordogne (Panama).	Foreign Conglomerate

BAKELITA Y ANEXOS S.A. EN INSOLVENCIA	Manufacturing (Plastic)	350	Founded in 1949	It owns Elba SA (Real Estate)	DENEUMOSTIER family	Private owned (Deneumostier)	Private Ownership
BAYER S.A.	Commerce (Pharmaceuticals)	150	Founded in 1947	In 2002, it buys Cropsa SAC	Bayer (Germany)	Bayer Foreign Investments Ltd., Toronto, Canada. In 1994, Bayer Gesellschaft, Germany.	Foreign Firm
BELLSOUTH PERU S.A. Y SUBSIDIARIAS	Services (Telecommunication)	900	Founded as Telemovil SA in 1990, it becomes BellSouth Peru SA in 1999		TELEFONICA DEL PERU S.A.A.		Foreign Firm
CARBOLAN S.A.	Fishing	200	Founded in 1988 as Farmocean de Sudamarica. In 1995		Rossel Family	Group	Private Ownership

			changed to Carbolan. In 1995 starts Carbolan Graphics del Peru (Graphic industry), in 1996 had a fusion with Cohipesa (Consorcio Hidrobiologico del Peru).				
CASTROVIRREYNA COMPAÑIA MINERA S.A.	Mining	220	Founded in 1942.	In 1997, it buys 18% of AD Minas SA which is the main holder of Corporacion Minera Castrovirreyna. In 1998, reaches 40.93%. In 2004, merger with Minera El Palomo SA.	Tode Family (42%), SELWAY HOLDINGS CORP. (18%, Bahamas), SOUTH TRADE METALS INC (7%, Virgin Isl)		Mixed Ownership
CEMA COMUNICACIONES S.A. EN INSOLVENCIA	Services(Telecommunication)		Founded In 1981	In restructuring since 2000	ACCIONISTAS PREFERENCIALES (80%), P.T. GLOBAL CORPORATION (20%)		Mixed Ownership

CEMENTOS LIMA S.A.	Construction	350	Founded in 1967 . Subsidiaries after 2007 are : Skanon Investments inc (Drake Cem LLC),Inveco (Inversiones en Concreto), Gea (Generacion Electrica de Atocongo), Celepsa (Compania Electrica El Platanal),De cosa (Deposito Aduanero Cochan), Cochan (naviera), Adelaida (Mining), Preansa (Prefabricato Andinos). In 2009 , also Transportes Lurin (State Island LLC).	In 2003 , the is the fusion with Lar Carbon SA. In 2005, it forms with Cemento Andino and Corp Aceros Arequipa the firm CELEPSA. In 2007 joint venture with Drake Cement LLC in the USA for a projct in Arizona.	SINDICATO DE INVERSIONES Y ADMINISTRACION S.A.(68%)	SINDICATO DE INVERSIONES Y ADMINISTRACION S.A. (Nuevas Inversiones S.A.)	Domestic Conglomerate

CEMENTOS PACASMAYO S.A.A.and SUBSIDIARIAS	Construction	400	Founded in 1957. Privitised state stake (49%) in 1994	In 2000, sells its subsidiary Cementos Norte Pacasmayo Energia to Nordic Power (Vattenfall Int hold, swiss, 22.2 mil USD). In 2003, it buys Zemex Corp (USA-Canada , 80.4 mil USD) with its subbssidiaries. In 2006 it buys the subsidiaries Invernor SA and Immobiliaria CNP SA.Subsidiarias: Zemex LLC y Subsidiarias, Cementos Selva S.A. y Subsidiarias (founded in 2000), Distribuidora Norte Pacasmayo S.R.L. (Cement), Corianta S.A. (Mining), Empresa de Transmisión Guadalupe S.A.C. y Tinku Generación S.A.C (Energy), Fosfatos del Pacífico S.A.	INVERSIONES PACASMAYO S.A.	Inversiones Pacasmayo of Group Pacasmayo (Hochschild Group) (FARRAGUT HOLDINGS INC. , Caiman). Hochscield Group owns also golden mines: Compania Minera Sipan, Ares, Arcata, Afrodita, Argento, Corianta, Pativilca, Selene.	Hochschiel d
CENTRAL AZUCARERA CHUCARAPI-PAMPA BLANCA S.A. And Subsidiaries	Agribusiness	100	Founded in 1992 from the Cooperativa Agraria Az Ch-pam Blanca. Subsidiary: Industrial Chucarapi Pampa blanca SA(Food and drinks)		INVERSIONES QUEBRADA HONDA S.A.(25%) and chirinos family (16%),COMFE INVESTMENT INC (15%), Oporto Family (13%) and KEMAGRO INDUSTRIALES INC. (18%, Bahamas)		Mixed Ownership
CENTROS COMERCIALES DEL PERU S.A.	Commerce	250	Founded in 1995		INMOBILIARIA ALTO LIMA S.A. (79%, Panama), INVERSIONES PUERTO NUEVO S.A.(21%)		Cosapi

CERVECERIA SAN JUAN S.A.A.	Commerce	400	Founded in 1971	In 2003, there is the fusion with oits subsidiary Agricola San Juan. Dollars in active. Lots in 2006 after restaurations.	UNION DE CERVECERIAS PERUANAS BACKUS Y JOHNSTON S.A.A.	Union de Cerveceria Backus and Johnston from 1998	Bentin
CIA. INDUSTRIAL NUEVO MUNDO S. A.	Manufacturing (Textile)	850	Founded in 1949	1998, fusion of Compañía Desmotadora Peruana S.A. and Compañía Industrial Nuevo Mundo S.A. To form Cia. Industrial Nuevo Mundo S.A.	Mayo and SCHWARTZMAN families	Mayo family	Private Ownership
COMPAÑIA CERVECERA DEL SUR DEL PERU S.A.A. CERVESUR	Commerce	1100	Founded in 1898,and 1929 as SA.	In 1993, subsidiaries are: Embotelladora del Sur SA, Embotelladora Frontera SA, Embotelladora Caplina (Containers) ; Transportes Generales Altiplano SA (transport), Comercio Servicios e Inversiones SA (services); Alimentos Procesados SA, Procesos Agroindustriales SA, Productos del Campo SA, Oleginosas y Derivados Majes SA (Food); Hilanderias Pimafina SA (Textile); Inmobiliaria 301 SA (Real Estate); Analistas y Consultores de Seguros SA (Finance). In 1997, it buys Compania Cervecera SA (Drinks) and sells Hilanderias Pimafina SA. In 1998, owns Comercial Excel SA (Drinks Distribution) and Servicios Aereos AQP SA.	UNION DE CERVECERIAS PERUANAS BACKUS Y JOHNSTON S.A.A.	Union de Cerveceria Backus and Johnston from 2000. Backus and Johnson arrived in 1997 in Peru	Bentin

COMPAÑIA DE MINAS BUENAVENTURA S.A.A. Y SUBSIDIARIAS	Mining	1000 (2000 con.)	Founded in 1953	In 1992, 6 % owned by IFC (WB). In 1996, merger with subsidiaries Compania de Minas Orcopampa SA, Compania de Minas Recuperada SA. It also owns Minera Yanacocha SRL and Minera Condesa SA and Sociedad Minera Cerro Vierde. Subs are many (see reports). In 2006, buys 21.96% of Inv Mineras del Sur SA (reaching 100%) and Minas Poracota SA. In 2009, buys additional 19.8% of Inversiones Colquijirca , which owns El Brocal SA. So indirectly owns more than 40% of it.	Benavides Family (14%), BLACKROCK INVESTMENT (10%, UK), CIA MINERA CONDESA S A (7%)		Mixed Ownership
COMPAÑIA GOOD YEAR DEL PERU S.A.	Commerce (Auto)		Founded in 1942.		THE GOODYEAR TIRE & RUBBER COMPANY		Foreign Firm
COMPAÑIA INDUSTRIAL TEXTIL CREDISA - TRUTEX S.A.A. - CREDITEX	Manufacturing (Textile)	500, then 2000	Founded in 1961	in 1997, fusion with Credisa SA. In 1998, fusion with El Progreso SA. Subsidiaries are: Texgroup SA, Servicios Aereo. In 2007, opens in Chile.	CORPORACION CERVESUR S.A.A. (80%), AMARANTE INVESTMENTS N.V. (12%, Netherl. Antilles)		Bentin
COMPAÑIA MANUFACTURERA DE VIDRIO DEL PERU LIMITADA S.A.	Manufacturing (Containers & Packaging)	260	Founded in 1922 . After 1999 with the crisis it was abandoned opting for importing glasses.	In 1993, fusion with Viplan SA . In 1999, Vidrio industrial buys 85%. Also there is a spin-off of Inmobiliaria Pariachi.		Vidrio Industrial (Owens Group , USA) from 1999	Bentin to Foreign in 1999

COMPAÑIA MINERA ATACOCHA S.A.A. Y SUBSIDIARIAS	Mining	400	Founded in 1936	Consolidaded includes subsidiaries: Inversiones Mineras SA(IMSA), Corporacion Minera San Manuel SA and Empresa Energetica de Chaprin SA (Chaprin). Other subs in 2000s. No difference in balance sheet data.	MILPO ANDINA PERU S.A.C. (70%), Fondos	In 2008, belongs to Votorantim Andina Peru SAC (Grupo Milpo)	Brescia
COMPAÑIA MINERA CONDESTABLE S.A.A.	Mining	30	Founded in 1964. In 1992, privatised.	In 1998, stopped production and selling extraction rights to Compania Minera Pativilca SA	URION WORLDWIDE INVESTMENT (92%, Bahamas), NIKKO COOPER INC (7%, South Korea)	Trafigura Beheer BV (Swiss) until 2006. Then Urion Worldwide Investment (Trafigura Group , Bahamas).	Foreign Firm
COMPAÑIA MINERA MILPO S.A.A. Y SUBSIDIARIAS	Mining	380 - 800(all conglo merate)	Founded in 1949.	Subsidiariaries are: Sindicato Minero Pacococha SA, Minera el Muki SA, Gestion Minera SA, Compania Minera Hilarion SA, Minera Cusipata SA, Cuyuma SA. In 1999, it owns also Milpo Finance Ltda and Milpo Investments Ltda. In 2002, buys Compania Minera Atacocha SAA. It buys Minera Rayrock Antofagasta.	VOTORANTIM METAIS - CAJAMARQUILLA S.A. (45%), COMPAÑIA MINERA MILPO S.A.A. (10%), CARVEL INC. (7.5%), Fondos		Brescia
COMPAÑIA MINERA RAURA S.A. Y SUBSIDIARIAS	Mining	200	Founded in 1960	Subsidiariaries are: Negocios y Servicios Santa Ines SA, Agroindustrias Cerro Negro SA y Sociedad Minera Huarimanta SA. In 1999, Agroindustria Cerro Negro SA is consolidaded.	GREAT YELLOWSTONE CORP. (63%), INVERSIONES SAN BORJA S A (37%)	Since 2002,Great Yellowstone Corp. (Panama), Inversiones Nacionales de Turismo SA	Brescia and Foreign Investment (since 1995)

COMPAÑIA MINERA SAN IGNACIO DE MOROCOCHA S.A. Y SUBSIDIARIAS	Mining	700	Founded in 1942.	Subs. are: Servicios Selva Central SA, Exploraciones Mineras San RamonSA and Exploraciones Mineras SA. No large difference in balance sheet.	CLARION HOLDING LTD. (49%), ORANGE BAY COMMERCIAL INC. (25%, Panama), TALINGO CORPORATION (23%, Virgin Isl.)		Foreign Conglomerate
COMPAÑIA MINERA SANTA LUISA S.A.	Mining		Founded in 1964		MITSUI LTD. (Japan)	Mitsui Mining & Smelting Co.Ltd. (Japan)	Foreign Firm
COMPAÑIA PERUANA DE ENVASES S.A. EN LIQUIDACION	Manufacturing (Containers & Packaging)		Founded before 1990.	In 1994, merger of Compania Peruana de Envases SA with its subsidiary Envases Varios SA		Sociedad Minera Austria Duvas SA	Bentin
COMPAÑIA UNIVERSAL TEXTIL S.A.	Manufacturing (Textile)	650 then 1000	Founded before 1980.	Compania Universal Textil SA is founded in 1998 as merger of Compania Universal Textil SA (before Confecciones Flyer SA) and Universal Textil SA (Founded in 1952).	INVERSIONES PIURANAS (18%, Romero), CENTENARIO S.A.A.(5%, Raffo), EL PACIFICO PERUANO-SUIZA CIA DE SEGUROS Y REASEGUROS (14%, group Raffo), CIA. DE JESUS PROVINCIA DEL PERU (11%), Alvarez family (7%)		Romero - Raffa

CONDUCTORES ELECTRICOS PERUANOS S.A. CEPER - EN REESTRUCTURACION	Manufacturing (Capital Goods)	220	Founded in 1965 as Pirelli Industria de Conductores Electricos SA. In 1975 changed name.then it pays 1.5% on sales to Pirelli Cavi Spa	Subsidiaries: CISSA (1992) and Laran (1986).In 1996, Colacon buys Cobre continuo SA from Ceper that only owns 49.9% later. Subsidiaries are: Ceper inversiones and servicios, Ceper Inmobiliaria, Ceper Agricola La Portata and Ceper Agricola Chavimochic. From 2004 in reconstruction	MONVISO CORP S.A. (49%, Panama), CEPER-INVERSIONES Y SERVICIOS S.A. (CISSA)(33%)		Foreign Firm
CONSORCIO INDUSTRIAL DE AREQUIPA S.A.	Manufacturing (Household Products	200	Founded in 1966		CANNOCK family (24%,PERU), LANMAN & KEMP BARCLAY (24%, USA), Carrillo family (9%)		Mixed Ownership
CONSTRUCCIONES ELECTROMECANICAS DELCROSA S.A.	Manufacturing (Capital Goods)	50	Founded in 1954	In 1997, stoped producing electric engine because int and ext competition.	GASHAKI CORPORATION (virgin isl.)		Foreign Firm
CORPORACION ACEROS AREQUIPA S.A. Y SUBSIDIARIAS	Manufacturing (Metals)	1000	Founded in 1964	It owns Transporte Bacino, Aceros Calibrato, Aceros del Sur SA. In 1997 merger of Aceros Arequipa and Aceros Calibrados SA	OLESA INVESTMENT CORPORATION (10%, Bahamas), Transportes Barcino SA (5%) and CILLONIZ family (31%)		Mixed Ownership

CORPORACION CERAMICA S.A.	Manufacturing (Household Products)	400	Founded in 1967, then changed to Ceramica Lima in 1994	In 1994 it merges with Ceramica del Pacifico (CERPAC) and Ceramica Mosaicos (CERMOSA)	INVERSIONES CERAMICA S.A.C.	Inversiones Ceramicas. Subs are Centro Ceramico Las Flores SAC, Ceramica Lima SA,Certrans SAC, Compania Minera Las Camelias SA, Corporacion Ceramica SA	Mixed Ownership
CORPORACION CERVESUR S.A.A. Y SUBSIDIARIAS	Construction	3000	Founded in 1997 as spin off of CERVESUR (1898)	It is formed by: CREDITEX; ALPROSA; TRANSALTISA; COMERCIO, SERVICIOS E INVERSIONES; PROAGRO; SERVICIOS AÉREOS AQP; ANACONSA, e INMOBILIARIA 301. It also partecipate in:AFP Profuturo, Compañía de Seguros La Positiva, Corporación Aceros Arequipa, Investa S.A.B., Investa Consultores y Edificaciones El Pacífico.	INTERGAMA (30%, Virgin Isls) and Interbeta CORPORATION (23%, Virgin Isls), La Positiva Vida Seguros (12%), Ningo Center (7%, Panama)		Bentin
CORPORACION JOSE R. LINDLEY S.A. Consolidaded	Commerce	2500	Found 1928. it is linked with Coca Inka. 80% of sales are in Lima.	in 1995,subsidiaries are EmbotelladoraBagua and Embotelladora Lambayeque. In 1999,Lindsley family sells 19.9% it is affiliated with Peru Beverage Ltda. (coca-cola company). The consolidaded includes Emb La Selva and Piura. From 2004, the consolidade shows Sociedad de Inversiones Lindsley and Sociedad de Cartera del Pacifico	Lindley Family		Lindley
DEL MAR S.A. Y SUBSIDIARIAS	Fishing	500	Founded in 1978.	Consolidaded in 1994 includes Pesquera Joaquin SA. In 1996 merger with Pescanova. In 1997, it buys Pesca Peru Huarney.	CORPORACION PESQUERA INCA S.A COPEINCA	become subsidiary of Banco Wiese Sudameris in 2001	Wiese

DERIVADOS DEL MAIZ S.A. And subsidiary	Agribusiness	150	Founded in 1961	In 1998, it merges with Provita SA. In 1999, CPG Holdings Inc. buys 56.93% (Cayman Islands). In 2002 , there is spin off of holdings Deraroma SA (shown in consolidaded). In 2008 it disappears, bought by Corn Products International Inc.	PRODUCTOS DE MAIZ S.A. (Argentina)	Corn Products International Inc.	Ferreyros to Foreign in 1999
DUKE ENERGY INTERNATIONAL EGENOR S.A.A.	Electricity	180	Privatised in 1994 from Electroperu.	In 1996, Inversiones Dominion Peru, of Duke Energy Inc. (USA), buys 60%. In 1997, Empresa de Generacion Electrica Nor Peru SA (EGENOR) is founded. In 1997. Chilgener SA bought 49% of Inversiones Dominion Peru SA. In 1999, Chilgener transfers its equity to Duke Energy Int. Peru Holdings.	DUKE ENERGY	Duke Energy	Foreign Firm
EDEGEL S.A.A.	Electricity	150	Founded in 1994 as 60% is privitised: onwed by Consorcio Generandes Co.	In 2006, merger with Empresa de Generacion Termoelectrica de Ventanilla SA (Etevensa). In 2008, owns Chinango as only subsidiary.	GENERANDES PERU S.A. (54%), ENDESA CHILE (30%), Fondos	Generandes Peru SA (Onwed by Endesa Chile , Spain)	Foreign Firm
EDELNOR S.A.A.	Electricity	700	Founded in 1994.		INVERSIONES DISTRILIMA S A (52%), ENERSIS S.A. (24%, Chile),Credicorp (5%)	Inversiones Distrilima SA (owning also EDECHANCAY) ,onwed by Endesa (Spain). In 2007, Enel Energy Europe srl and Acciona SA bought 67% and 25% of Endesa. In 2009 Enel bought the 25% from Acciona SA.	Foreign Firm
ELECTRO SUR ESTE S.A.A.	Electricity	200 to 400	Founded in 1983		FONAFE (99%), Private (1%)	FONAFE (99%), Private (1%)	Semi-Public

ELECTRO SUR MEDIO S.A.A.	Electricity	225	Founded in 1912, was privatised in 1997. In 1997, Hica Inversiones sa was formed and bought Electro Sur Medio. In 2009 , changes to Electro Dunas SA		DUNAS ENERGIA SRL		Mixed Ownership
EMBOTELLADORA LATINOAMERICANA S.A. - ELSA Y SUBSIDIARIAS	Commerce	2000	Founded 1947. Stops in 2004	In 1995 merger with Indo Quina, Sabores Amazonicos, Distribuciones Geminis SA, Cural (transport), La purezza, Discofassa, Tisco. In 1997, merger with Porvent SA. In 1997, merger with firms which were no related: Negociacion Sur Peruana, Comp Industrial Nor Peruana, Emproplast, Traspordadora Lambayeque, Costos and Margenes. The consolidaded balance includes Comp Indus. Nor Oriente(Ciinorsa) and Industrial Iquitos SA (IISA).	SOCIEDAD DE CARTERA DEL PACIFICO S.R.L. SOCAP (81%, Coca Cola), and Lindley (11%)	Embonor Holdings through SOCAP (Sociedad de Cartera del Pacifico SRL). In 2004 SOCAP transfer to Corporacion Jose R. Lindley SA.	Foreign Firm

EMPRESA AGRARIA AZUCARERA ANDAHUASI S.A.A.	Agribusiness	1300 to 2000	Founded in 1996 from cooperativa	Its subsidiaries are Industrial Andahuasi and Empresa Agraria Andahuasi Manco Capac	RIO PATIVILCA S.A (28%), DUCKTOWN HOLDINGS S.A. (17%, Panama), ABACO CORPORACION SOC. ANONIMA CERRADA (16%), ZABUCK INTERNATIONAL INC (13%, Panama), INDUSTRIAL ANDAHUASI S.A.C. (9%)		Foreign Conglomerate
EMPRESA AGRARIA CHIQUITOY S.A.	Agribusiness	200 to 450	Founded in 1992	Sell most of its product to the parent company and Casa Grande sa.	CARTAVIO S.A.A (50%), AGROHOLDING S.A.C. (49%),	Complejo Agroindustrial Cartavio S.A.A	Banda
EMPRESA AGRICOLA BARRAZA S.A.	Agribusiness	50	Founded in 1996	in 2009, Spin off of subsidiaries: Compania Agricola Miraflores, Comp Agricola Chocas SAC, Vallesol SAC, Inmobiliaria Barraza SAC, Fruit and Vegetables Peru.	Mantilla Family(48%), J.P. FLETCHER SUGAR ENGINERING CORPORATION (20%, Panama), AGRUPACION DE FINANZAS BANELCO S.A (13%, Panama), MISKI INVERSIONES Y NEGOCIOS S.R.L. (7%)		Mixed Ownership

EMPRESA AGRICOLA GANADERA SALAMANCA S.A.A.	Agribusiness	100	Founded in 1992		Private (VASQUEZ, SANCHEZ, PAJARES, ESTEVES), DESTILERIA CHICLAYO S.A.C (7%)		Private Ownership
EMPRESA AGRICOLA SAN JUAN S.A.A.	Agribusiness	70	Founded in 1986		CORPORACION PERHUSA S.A	PERHUSA	Domestic Conglomerate
EMPRESA AGRICOLA SINTUCO S.A.	Agribusiness	160	Founded in 1996		CORPORACION AZUCARERA DEL PERU SOCIEDAD ANONIMA - COAZUCAR DEL PERU S.A. (58%),CARTAVIO S.A.A (15%), Galloso family (13%)	In 1999, Azucagro SA buys 51%.	Banda
EMPRESA AGROINDUSTRIAL LAREDO S.A.A.	Agribusiness	800	Founded in 1970		MANUELITA INTERNACIONAL S.A. (64%, Colombia), INVERSIONES MANUELITA S.A. (14%, Colombia), Family Velarde (6%)	In 1998, Manuelita SA bought 64.21% (Colombia). In 2006 reached 78.75%.	Foreign Firm

EMPRESA AGROINDUSTRIAL POMALCA	Agribusiness	3000	Founed in 1970 as Cooperativa.		Family Oviedo (14%), CORPORACION AGROINDUSTRIAL DEL NORTE SAC (13%), FONAFE(15%), SEGURO SOCIAL DE SALUD (9%), OFICINA DE NORMALIZACION PREVISIONAL ONP (8%)		Mixed Ownership
EMPRESA AGROINDUSTRIAL TUMAN S.A.A.	Agribusiness	3000	Founded in 1970 as Cooperativa. Changes status in 1995.		Family Oviedo (6%), BORLINGHTON TRADING CORP (14%, Panama)		Mixed Ownership
EMPRESA AZUCARERA "EL INGENIO" S.A.	Agribusiness	300	Founded in 1992.	Sells its products to Agro Industrial Paramonga SA	CONSORCIO ALCOHOLERO DEL NORTE S.A.(48%), ARGEX TRADING FINANCE LTD. (11%,Virgin Isl) and HARKEITH CORPORATION (11%,Virgin Isl)		Mixed Ownership
EMPRESA DE LA SAL S.A.	Commerce	100	Founded in 1969		QUIMPAC S.A	Quimpac SA from 1994	Fishman

EMPRESA EDITORA EL COMERCIO S.A. Y SUBSIDIARIAS	Services (Media)	600	Founed in 1928	In 1996, merger between "El Comercio" and Servicios Teleinformaticos SA, Estabilimento Grafico Amauta SA, Derivados Generales SA. It buys Orbis Ventures S.A.C. (2000), Zetta Comunicadores del Perú S.A.E.M.A.(1995), Inmobiliaria El Sol del Perú S.A. (1954) and Ec JobShark S.A.C. (2001), Grupo TV Peru (2003), Producciones Cantabria SAC (2006), Punto y Coma Editores SAC (2006), Subscripciones Integrales SAC (2006).	Miro Quesada Family (20%)		Private Ownership
EMPRESA REGIONAL DE SERVICIO PUBLICO DE ELECTRICIDAD ELECTRONORTE MEDIO S.A. - HIDRANDINA	Electricity	200 to 300	Founded in 1984 within Electroperu.	From 1990 administers the Lesser Hydraulic Thermic Generation Stations and the Interconnected Grid's electricity	FONAFE	Grupo Distriluz which owns: Electronorte SA, Electrocentro SA, Electronoroeste SA, Hidrandina SA	Semi-Public
EMPRESA SIDERURGICA DEL PERU S.A.A. - SIDERPERU	Manufacturing (Capital Goods)	1000	Founded in 1971, privatised process started in 1992. In 1996 Sider Corp (Acerco SA, Wiese Inversiones Finacieras SA and Stanton Funding LDC) buys it for US$ 163 mil.	In 1998, merger between Compania Siderurgica del Peru and Empresa Siderurgica del Peru SA (Siderperu) and its subsidiarias (Tubos y Alcantarillas SAC and Tubos y Estructuras SA)	GERDAU S.A. (87%,Brazil)	Gerdau SA de Brasil from 2006	Wiese to Foreign Conglomerate in 2006

EXSA S.A. Y SUBSIDIARIAS	Manufacturing (Capital Goods)	250-500	Founded in 1954	In 1995, subsidiaries are: Fontargen Latinoamericana SA, Servicios Tecnico SA, Exsa Comercial SA. In 1996, merger Fontargen -Exsa. In 1996,Acquisition of Valores Lurin SA (holding). In 2000, buys Quimica Sola SA (Chemicals). In 2002 it buys ALW Chile (same industry) and Nitrocorp SA (Chemicals). Subsidiaris in 2002 are the last two plus Valore Lurin SAC.	INVERSIONES SAN BORJA S A (35%), INVERSIONES BRECA S A (23%), MINSUR SA (17%), other		Brescia
FABRICA NACIONAL DE ACUMULADORES ETNA S.A.	Manufacturing(Capital Goods)	200	Founded in 1945	In 2008, open branch in Chile, not much diff with consolidaded balance.	PEYON Family		Private Ownership
FABRICA PERUANA ETERNIT S.A.	Manufacturing	130	Founded in 1940	Subsidairias: Nicoll Eterplast (99% then 39% in 1995), and Ceramica SAn Lorenzo (50%). Huge injection of capital in 1995. In 1995 there is the merger with PROVISSA (Compania constructoria Inmobiliaria y promotora de vivienda social) and COMINCA (compania Industrial comercial)	ETEX PERU S.A.C.	From 1998, Etex Peru SAC	Foreign Conglomerate
FABRITEX PERUANA S.A. EN INSOLVENCIA	Manufacturing (Textile)	1100	Founded in 1947. Insolvency in 2002	In 1996, merger with : Negociacion Don Leon SA, Textil Maritima Kid Lan Peruana, Corporacion Textil Mina, Textil Don Alejandro, Inmobiliaria Davisa, Peru Teje, Compania Industrial Ibatex, Desmotadora San Jorge.	GORYN Family (73%) , DISCOUNT ENTERPRISES CORP. (17%, Virgin Isl.) and CIGNA ENTERPRISES CORP. (9%, Virgin Isl.)		Private Ownership

FERREYROS S.A.A. Y SUBSIDIARIAS	Commerce	1500-2500	Founded in 1922.	Subsidiarieas in 1992 are : Organizacion Victoria, Fca de Implementos Agricolas Nacionales, Motorindustria, Exco, Trevor, Fersil, Depositos Efe, Motored (sold in 1997). Later in mid 1990s added Heavy machineries services, Domingo Rodas. In time changes, in 2006 they are: Ferreyros SAA, Unimaq SA, Orvisa SA, Domingo Rodas, Fiansa, Motorindustria, Depositos Efe, Ferreenergy, Consorcio CERES. In 2007 adds Cresko, Mega Cauch.	Varios Fondos		Ferreyros
FILAMENTOS INDUSTRIALES S.A.	Manufacturing (Textile)	100-150	Founded in 1974		MUSIRIS Family		Private Ownership
FIMA S.A.	Manufacturing (Capital Goods)	90	Founded in 1993 as merger of Fabricacion Industrial de Maquinarias SA and Select wood SA	all transactions in USD	Zoia and Nesta family, JANSVILLE TRADING & CO. (17% panama), WOODLEY CONTINENTAL INC (16%, Panama)		Mixed Ownership

GLORIA S.A.	Commerce	500-1000	Founded in 1941. In 1993 merges with Deprodeca (Distribution Exclusiva de Productos de Calidad SA) and Farpasa(Farmaceutica del Pacifico) and Centro Papelero SA	In 1999, it absorbes Carnilac SA. The consolidaded balance since 2006 includes also Yura (Cement), Cemento Sur, Industria Cachimayo SA (Chemicals), Empresa Oriental de Emprendimientos (EMOM) (Investments in Bolivia), Pil Andina (Milk products in Bolivia).In 2007, also Agroindustial del Peru. In 2008 Trupal SA mergers with Centro Papelero SA and Manufacturera de Papeles Y Cartones del Peru SA. In addition, spinn-off of Consorcio Cementero del Sur which takes, Cemento Sur, Yura Sa, Industrias Cachimayo SA. In 2009 sells Farmaceutica del Pacifico for 19.718 mil S.	BANDA FAMILY (75%), RACIONALIZATION EMPRESARIAL SA, SILVERSTON HOLDINGS INC (USA)		Banda
GRAÑA Y MONTERO S.A.A. Y SUBSIDIARIES	Construction	3600	The SAA was founded in 1996 (Holding). The group is involved in Ing. And Infrastructure (70%), Oil (11%), Estate (8%),Systems (10%)		GH HOLDING GROUP CORP. (21%, panama), BETHEL ENTERPRISES (Panama), other		Domestic conglomerate

GRUPO SINDICATO PESQUERO DEL PERU S.A.	Fishing	1800	Founded in 1992, starts in 1994. The group was called Empresa Almex SA until 1996.	For the group. Empresa relacionadas: Inversiones Maritima Chiclayp SA, Inversiones Andraix SA, Empresa Almex SA. Subs: Pesca Peru Chicama SA, Consorcio de exportanciones sindicato pesq del peru sA, Pesqueria don Miguel SRL, Pes Don Rodriguez SRL, Pes. Don Enrique SRL, Pes. Waljourzu SRL, P. Constancia SRL, P. AMbar SA, Pacifico del Norte SA. Main group is formed by Sind Pes Matarani SA, Electro Cahua SA, Sociedad distributora de alimentos SA, Empresa de Acesoria Y Servicio SA, Industrias Navales SA and Servicios Aeronauticos Sipesa SA	INVERSIONES BRECA S A (60%), INVERSIONES SAN BORJA S A (17%), URBANIZACION JARDIN S.A. (17%), URBANIZACION SANTA MARINA S A (5%)		Brescia
HIDROSTAL S.A.	Manufacturing (Capital Goods)	150 - 400	Founded in 1955		HIDROSTAL HOLDING A.G. (Swiss, Panama)	From 2006 , Hidrostal Holding SA (Swiss)	Foreign Firm
INCA TOPS S.A.	Manufacturing (Textile)	300-1000	Founded in 1965		AMSUD ANSTALT (51%,swiss), CARABAYA INVERSIONES Y FINANZAS S.A. (41%)		Mixed Ownership
INDECO S.A.	Manufacturing (Capital Goods)	250	Founded in 1952	In 1995 , big merger with subsidiaries and other copper manufacturers which is reflected in 1994 statement. (see list in 1995). In 1999, merger with Invercob SA , a subsidiarty of Madeco. The consolidaded balance for 2000 includes Productos Industriales Varias Aplicaciones SA.	INVERCABLE S.A. (Chile)	Subsidiary of Madeco SA del Chile. In 2009 is subsidisry of Nexans SA (France) through Invercable SA (Chile)	Foreign Conglomerate

INDUSTRIA TEXTIL PIURA S.A.	Manufacturing (Textile)	600	Founded in 1972		INVERSIONES TULIPAN S.A. (33%), CERNICAL GROUP S.A. (13%), Bouillon Family (7%), INVERSIONES PIURANAS S.A. (7%), NEGOCIACION AGRICOLA MALLARES S.A. (5%)		Romero
INDUSTRIAS DEL ENVASE S.A.	Manufacturing (Containers & Packaging)	250	Founded in 1971 as Industrial Cacer S.A.	In 1994 , it merges with Editorial Imprenta Amarú S.A. Changing name in Industrias del Envase S.A. From 1998 it appears as subsudy of Backus	Unión de Cervecerías Peruanas Backus y Johnston S.A.A	Unión de Cervecerías Peruanas Backus y Johnston S.A.A	Bentin
INDUSTRIAS ELECTRO QUIMICAS S.A. IEQSA	Manufacturing (Chemicals)	400	Founded in 1963	In 2003,Umicore (Belgium) buys 40%. In 2005, is a subsidiary of Parma Holdings SA (Panama Republic) buying 60%.	PARMA HOLDINGS S.A (60%), UMICORE (40%)		Foreign Firm
INDUSTRIAS VENCEDOR S.A. And subsidiary	Manufacturing (Chemicals)	350	Founded in 1969	The consolidaded includes Tinta Graficas SA	INDUSTRIAS TRICOLOR PERU S.A.	Industrias Tricolor Peru SA (Chile)	Foreign Firm
INTRADEVCO INDUSTRIAL S.A.	Manufacturing (Chemicals)	200-1200	Inter American Trade Development Company Sa founded in 1949	In 1998, spin off of Intradevco Industrial SA from Intradevco SA. In 2005 it is owed by Tecnología Aplicada (99% Virgin Islands)	TECNOLOGIA APLICADA S.A. (Virgin Isl)		Foreign Firm

INVERSIONES CENTENARIO S.A.A. Y SUBSIDIARIAS	Construction	50	Founded in 1986	In 1993, merger between Inversiones Centenario SA and La Inmobiliaria SA. Subsidiaries: Edificaciones Macrocomercio SA, Promotora Santo Domingo SA, Cosmosan Anstalt, Inversiones Nueva Metropoli SA, Edificaciones Melgarejo SAC, Promotora San Pedro SAC, Promocion Inmobiliaria del Sur SA, Centro Empresarial El Derby SA, Paz - Centenario SA, IDK SA.	CREDICORP LTD. (13%), ATLANTIC SECURITY BANK (11%, Caiman),GOOD RATE CORPORATION (5%, Panama), Romero Family (12%), RIMAC INTERNACIONAL COMPAÑIA DE SEGUROS (5%)		Mixed Ownership
INVERSIONES EN TURISMO S.A. INVERTUR Y SUBSIDIARIAS	Services	300	Founded in 1975	During 2000 subsidiaries become: La Angostura SA, Inversiones en Turismo SA	PAYKEL DEVELOPMENT INC (25%), LUKEVILLE CONSULTANCE INC (23%), SARRAN TRADING (21%), INVERSIONES VERDUN (13%)		Foreign Firm
INVERSIONES NACIONALES DE TURISMO S.A. INTURSA	Services	500	Founded in 1971		INVERSIONES BRECA S A (48%), URBANIZADORA JARDIN S A (30%), INVERSIONES SAN BORJA S A (14%)		Brescia
INVERSIONES PACASMAYO S.A. Y SUBSIDIARIAS	Construction	1400	Founded in 1973	In 1995 subsidiaries are : Cementos Norte Pacasmayo SA, Distribudora Norte Pacasmayo S.R. Ltda., Invernor S.A. and Cordasa. In 1997, Cementos Norte Pacasmayo Energia.	FARRAGUT HOLDINGS INC. (95%, Caiman)		Hochschild

IQF DEL PERU S.A. Y SUBSIDIARIAS	Commerce	800	Founded in 1987	In 1998, the consolidaded balance includes Sociedad Agricola Tacaraca SA (50% and more later, founded in 1995) and Ecomar SA(50%, founded in 1995). In 2004 merger with Tacaraca SA.	Fernandini Family, Andean Holding Inc. (10.3%, Chile)	Fernandini Family , 10% Andean Holdings Chile	Private Ownership
LAIVE S.A.	Agribusiness	200	Founded in 1994, changed name from Sociedad Ganadera del Centro SA. In 1995, recives 11.85 mil USD from State over 2 years		COMERCIAL VICTOR MANUEL S.A. (38%), VALORES AGROINDUSTRIALES S.A. (38%)	Empresa Sta. Carolina (Cayman) and Valores Agroindustriales	Mixed Ownership
LAPICES Y CONEXOS S.A. LAYCONSA Y SUBSIDIARIAS	Commerce	50 to 400	Founded in 1965.	In 1999, buys Agricola Pampa Baja SAC as shown in the consolidaded balance.	HOLDING EL SOL S.A.C. (Parede Family)		Private Ownership
LIMA CAUCHO S.A.	Manufacturing (Auto)	50 to 400	Founded in 1955		BLUE ORBIS CORP. (37% Panama), COMERCIALIZADORA DE LLANTAS UNIDAS S.A. (37%, Colombia),CLEAT ONE BUSINESS, INC. (12% UK),	Universal Investors Ltd. until 1995, after Industria Colombiana de Llantas SA. In 1998, bought by Mavalle Ltda. In 199, bought by Season Group Limited (Bahamas). In 2005, Season sells half of the shares to Comercializadora Llantas Unidas SA (Colombia). In 2008 Season Group transfered	Foreign Firm

						its share to Blue Orbis Corp. (Panama).	
LP HOLDING Y SUBSIDIARIAS	Construction	500	In 1996 changed from Los Portales to LP Holdings	It owns Textil San Cristobal SA, Los Portales SA, Compania Minera Caudalosa SA,. In 2007 buys 50% of Inversiones de Estacionamientos SA. In 2008, it buys 50% of Inversiones en Inmuebles SA			Raffo
LOS PORTALES	Construction	100	Founded in 1977				Raffo
LUZ DEL SUR S.A.A. Y SUBSIDIARIAS	Electricity	600	Founded in 1994, It was Edelsur (Empresa de Distribucion Electrica de Lima Sur SA)	In 1996 includes the subsidiaries Empresa de Distribucion Electrica de Canete SA, Inmobiliaria Luz del Sur SA, Luz del Sur International AVV.	ONTARIO - QUINTA S.R.L. (61%), PERUVIAN OPPORTUNITY COMPANY S.A.C. (13%)	Consorcio Ontario Quinta AVV (Chilquinta SA , Chile, and Ontario Hydro Int. Inc., Canada). In 2004,Peruvian Opportunity Company SAC (PSEG Americas Ltd and Sempra Energy International Holding BV)	Foreign Conglomerate
MALTERIA LIMA S.A.	Commerce	120	Founded in 1955			Unión de Cervecerías Peruanas Backus y Johnston S.A.A	Bentin
MANUFACTURA DE METALES Y ALUMINIO "RECORD" S.A.	Manufacturing (Metals)	200 to 300	Founded in 1934		SCHWARZ family, FREITAG family, HAUSTEIN family		Private Ownership

MARMOLES Y GRANITOS S.A.	Mining	50	Founded in 1940		Menchelli Family(87%) , GREEN FEE INVESTMENT S.A. (13%)		Menchelli
METALURGICA PERUANA S.A. - MEPSA	Manufacturing (Metals)	250	Founded in 1960		SUDAMERICANA DE FIBRAS S.A. (44%), INVERSIONES AEGIS S.A. (29%, Chile), SOUTH AMERICAN MINERALS INC. (15%, Panama), SPRING CREST LTD. (12%)	Since 1995,Sudamericana through Sudamericana de Fibras SA (44%)and Inversiones Aegis SA (29%,Chile)	Ferreyros and Mixed
MICHELL Y CIA. S.A.	Manufacturing (Textile)	400 - 850	Founded in 1957	Changed name from Alpalana SA in 1999.	Michell Family		Private Ownership
MINSUR S.A. Y SUBSIDIARIAS	Mining	400	Founded in 1966	Subsidiaries are Funsur SA (until 2007), Minera Carabaya SA. In 2005 includes Cumbres Andina SA and Compania Minera Barbastro SA (subsidiary of Cumbres). In 2007 also Minera Sillustri SA. In 2008, Minera Latinoamericana SAC and its subsidiary Serra de Madeira Participacoes Ltda (Brazil) and Mineracao Taboca SA (Brazil). In 2009, a subsidiary of Minera Latinoamericana, Inversiones Cordillera del Sur Ltda. (founded in Chile) buys Blue Circle Chilean Holdings Ltda (Chile) which have subs in Chile such as Cementos Melon SA.	INVERSIONES BRECA S A (99%)	Inversiones Breca SA	Brescia

MOTORES DIESEL ANDINOS S.A. - MODASA	Manufacturing (Capital Goods)	90	Founded in 1974	Since 1995, balance includes subsidiary Modasa Comercial SA	GRUPO SAN JUAN INVERSIONES S.A. (50%), INVERSIONES EUROMAQ S.A.C. (50%)	Semi-state: Cofide owned 48%, Grupo San Juan SA 26%, Perkins Engines Ltd. 26%.	Semi-Public to Foreign (2005)
NEGOCIACION AGRICOLA VISTA ALEGRE S.A.	Agribusiness	30	Founded as Cooperativa, it changes in 1997.	Since 2006 it stops production	AGRUPACION DE FINANZAS BANELCO S.A (24%), Family Burga (20%), J.P. FLETCHER SUGAR ENGINERING CORPORATION (15%, Panama), Arbulo Family (16%), Arambulo (8%), B.B.F. S.A. (7%, Panama)		Mixed Ownership
NEGOCIOS E INMUEBLES S.A.	Construction	30	Founded before 1990.	In 1993, Agro Empaques SA absorbeb Negocios y Inmuebles SA. Adopting the name.	HELMSLEY MANEGEMENT INC (18%, USA), FUNDACION WIESE (13%), ADMINISTRACION MOBILIARIA E INMOBILIARIA S.A. (6%)		Menchelli, Wiese and others
NUEVAS INVERSIONES SA Y SUBSIDIARIES	Construction	700	Founded in 1965	Consolidaded: Sindicato de Inversiones y Administracion SA (53%), Cemento Lima SA (68%), Inversiones en Concreto y Afines SA (60%), Generacion Electrica de Atocongo SA, Transportes Lurin SA, Deposito Aduanero Cochan SA, Minera Adelaida SA, Naviera Conchan. Later CELEPSA 60%,			Domestic Conglomerate

				Drake Cement 77%			
PERU REAL ESTATE S.A.A.	Construction	300	Founded in 1991 as Constructora Manzanilla SA. In 1993, changed to 1993. In 2000, changed to Peru Holding de Turismo SAA		RONCESVALLES S.A (20%, Panama), PERUVAL CORP S.A. (24%, peru and panama), LATIN SECURITY CORPORATION (18%, Panama), SHEARSON LEHMAN BROTHERS (11%, USA), MIYASATO ONAGA Family (6%)		Mixed Ownership
PERUANA DE ENERGIA S.A.A.	Electricity	2	Founded in 1996	In 1997, merger with Compania Electrica del Perene SA.	FARNELL RESOURCES INC. (23%, Panama), MONTE AZUL INVESTMENTS S.A. (21%, Panama), EDGEMONT CORP. (15%, Panama), SAINT PAUL HOLDING GLOBAL CORP. (15%, Panama)		Foreign Conglomerate
PERUBAR S.A.	Manufacturing (Metals)	60	Founded in 1957	In 2000, concession to Empresa Minera Yauliyacu	GLENCORE MINERA AG (Swiss)	Marc Rich & Co. Minera SA, then Glencore Minera	Foreign Conglomerate

PROMOTORA CLUB EMPRESARIAL S.A.	Services	50	Founded in 1995, start operation in 1998.		COLOCACIONES PUBLICITARIAS S.A. (25%), Banco Latino (5%), Banco de credito (2%), Family Vega (5%), Family Zamorano (5%), Telefonica Peru (2%)		Domestic Ownership
QUIMPAC S.A. And subsidiary	Manufacturing (Chemicals)	400	Founded in 1996 from merger of Quimica del Pacifico SA (privitised in 1992)and Servicios Quimicos Optimos SA	In 2005, buys Empresa de la Sal SA (colombia)	QUIMPAC CORP.S.A.C.	Arinco SA (Grupo Marcos Fishman, Israel)	Fishman
REACTIVOS NACIONALES S.A. RENASA	Manufacturing (Chemicals)	50 to 90	Founded in 1961.		IMPERA CORPORATION (68%), LUKEVILLE CONSULTANCE INC. (22%)	Empresa Minera del Centro del Peru sa - CENTROMIN PERU until 1993 when privatised. Then Impera Corporation (65%, Panama), Friars Corporation (15% , USA), ING Baring (13%, USA), Sociedada Minera Puquio Cocha (7%, Peru)	Foreign Firm
RED BICOLOR DE COMUNICACIONES S.A.A. - RBC TV S.A.A.	Services (Media)		Founded in 1984	In 2003, consolidaded balance sheet includes Radio Tigre SAC.	Vallarino Family		Private Ownership

REFINERIA LA PAMPILLA SAA	Manufacturing		Founded in 1994, operative from 1996		REPSOL YPF PERU	Repsol YPF Peru	Foreign Firm
SAGA FALABELLA S.A.	Services	3000	Founded in 1953. called Sociedad Andina de los grandes Almacenes SA from 1984 to 1999		FALABELLA PERU S.A.A.	Inversora Falken SA, Grupo Falabella de Chile	Foreign Firm
SHOUGANG GENERACION ELECTRICA S.A.A.	Electricity	50	Founded in 1997, spinn-off from Shougang Hierro Peru SAA		SHOUGANG CORPORATION	Shougang Corporation (China)	Foreign Firm
SHOUGANG HIERRO PERU S.A.A.	Mining	1500	Founded in 1952 as Marcona Mining Company. Changed name in 1975 in Hierro Peru, privatised in 1993.		SHOUGANG CORPORATION (China)		Foreign Conglomerate
SOCIEDAD INDUSTRIAL DE ARTICULOS DE METAL S.A.C. - SIAM	Manufacturing (Metal)	60-180	Founded in 1937., ex SIAM Mario Canepa y Cia.		Canepa Family, COLOCACIONES E INVERSIONES LATINAS S.A. (15%)		Private Ownership

SOCIEDAD MINERA EL BROCAL S.A.	Mining	300	Founded in 1956		INVERSIONES COLQUIJIRCA S.A. (51%), Fernandini Family (8%)	Inversiones Colquijira SA (Grupo Buenaventura)	Mixed Ownership
SOUTHERN PERU COPPER CORPORATION, SUCURSAL DEL PERU	Mining	3500	Founded in 1954		SOUTHERN COPPER CORPORATION	Southern Copper Corp. (USA, owned by Grupo Mexico SA de C.V.)	Foreign Firm
TABACALERA NACIONAL S.A.A. -TANASA (Now British American Tobacco del Peru Holdings SAA)	Commerce	200	Founded in 1964. In mid 1990s the owner were York International Ind. And |Kentucky Industries Corp.	IN 2003 bought by Brit Am tob.	YORK INTERNATIONAL INDUSTRIES and KENTUCKY INDUSTRIES CORPORATION, panama	British American Tobacco Peru Holding Limited	Foreign Firm
TELEFONICA DEL PERU S.A.A. Y SUBSIDIARIAS	Services (Telecommunication)	6000	Founded in 1920. Privitised in 1994. In 1995 changed from Compania Peruana de Telefonos SA into Telefonica de Peru SA. CPT merged with ENTEL Peru.	Since 1997 owns Telefonica Soluciones Globales SA, Telefonica Multimedia SA, Telefonica Servicios Financieros SA, Telefonica Producciones SA, Telefonica Servicios Internet del Peru SA. In 2002, Transporte Urgente de Mensajeria SAC, Servicios Editoriales del Peru SAC. In 2007, it buys Telefonica Moviles SA	Telefonica	Telefonica (Spain)	Foreign Firm

TELEFONICA MOVILES PERU HOLDING S.A.A.	Services (Telecommunication)	1200	Founded in 1990 as Telemovil SA, became in 1992 Tele 2000 until 1999, then BellSouth Peru SA. In 2004, becomes Comunicaciones Moviles del Peru SA y subsidiaria (subsidiary of Latin America Cellular Holdings BV ,Holland, which belongs to Grupo Telefonica Moviles , Spain) after the acquisition from Grupo Telefonica (97.43%). In 2005, reorganisation and merger with Telefonica Moviles SAC. In		TELEFONICA DEL PERU S.A.A.		Foreign Firm

			2008, telefonica del Peru becomes the main owner.				
TEXTIL SAN CRISTOBAL S.A.	Manufacturing (Textile)	2000	Founded in 1942.	In 1993, merger with Consorcio Peruano de Confecciones SA	SCOTIA SOCIEDAD TITULIZADORA S.A. (LP Holding,39%), LA FIDUCIARIA S.A. (33%), ATLANTIC SECURITY BANK (9%, Caiman)		Raffo and Mixed
TICINO DEL PERU S.A.	Commerce	40	Founded in 1961	In 1995, it buys M. Componentes Metalicos SA	BTICINO S.P.A. (Italy)	Ticino SPA (49% Italy)	Foreign Firm

UNION DE CERVECERIAS PERUANAS BACKUS Y JOHNSTON S.A.A. Y SUBSIDIARIAS	Commerce	1300 to 5500 (cons)	Founded in 1879. from 1955 is Peruvian. The business is divided in 5 divisions: Drinks, Boxes and containers, Food, Transport and Financials.	In 1991, it owns Cerveceria San Juan SA, Cerveceria del Norte SA, Jugos del Norte SA (Drinks); Cia. Manufacturera de Vidrio del Peru (Containers); Industrial Cacer SA, Backus Y Johnson trading SA, Backus Y Johnson, Corporacion Transportes San Luis SA, Editorial Imprenta Amaru SA, Quipudata SA, Odracir SA, Asbe SA, Aficomo SA. In 1992, it buys Animadores del Agro SA, Malteria Lima SA and Industrias Fast SA.In 1994, it buys Industrias del Envase SA (Containers) and Inversiones Los Descalzos (transport). In 1996, merger with Compania nacional de Cerveza SA, Sociedad Cervecera de Trujillo SA and Cerveceria del Norte SA. It buys Agua San Matia (Drinks). In 1999, it buys Inmobiliaria Parachi SA (Real Estate) and sells Cia Manufacturera de Vidrio del Peru Ltda SA.In 2006 large merger: Comp Cerveceria del Sur del Peru, Embot. San Marco, Quipudata, Corporacion Backus and John., Backus and John Trading, Vidrios Planos del Peru, Inmobiliaria Pariachi, Inversiones Nuevo Mundo 2000, Munoz.	RACETRACK PERU S.R.L. (67%), BAVARIA S.A. (30%, Colombia)	In 1989 established in UK, under Bavaria (Colombia). In 2005 under SABMiller plc.(UK) through Bavaria SA and subsidiary of Racetrack Peru SRL.	Bentin
VIDRIOS INDUSTRIALES S.A. - VINSA	Manufacturing (Containers & Packaging)		Founded in 1965	In 1992, investment by Owens illinois Inc, and its subsidiary Cristaleria Pedlar SA	Owens belongs to OI PERU STS INC. (Peru)	Owens Ilinois Inc	Bentin to Foreign in 1992

VIDRIOS PLANOS DEL PERU S.A.A	Manufacturing (Containers & Packaging)		Founded in 1943	In 1992, buys 11% of Compania Manufacturera de Vidrio del Peru	INVERSIONES NUEVO MUNDO 2000 S.A. (83%), UNION DE CERVECERIAS PERUANAS BACKUS Y JOHNSTON S.A.A. (15%)	Inversiones Nuevo Mundo 2000 SA	Bentin
VOLCAN COMPAÑIA MINERA S.A.A. Y SUBSIDIARIAS	Mining	2000	Founded in 1943. In 1998, Volcan Compania Minera SAA is formed from the merger.	In 1997, merger with the privatised Empresa Minera Mahr Tunel SA. For the consolidated: In 1999, it buys Empresa Minera Paragsha SAC. In 2000, Empresa Administradora Chungar SAC and Exploradora de Vinchos Ltda SAC. In 2007, it buys Compañía Minera El Pilar SAC, Compañía Minera Alpamarca S.A.C., Shalca Compañía Minera S.A.C and Minera Aurífera Toruna S.A.C. In 2008, buys Compañía Minera Huascarán S.A.C.	GREENVILLE OVERSEAS INVESTMENTS LTD.(19%), Fondos		Mixed Ownership
YURA S.A.	Construction	380	Founded in 1958	In 1994, buys Urquiaga SA. In 1995, 15% of capital for Industria de Cemento SRL. In 1995, merger of Cemento Yura and Concorcio de Concreto y Cemento SA to form Yura SA.	CONSORCIO CEMENTERO DEL SUR S.A.	Grupo Gloria SA for US$ 67,100 mil. In 2008 , concorcio Cementeros del Sur SA.	Domestic conglomerate

Appendix C

Table C1: List of companies

AGRO INDUSTRIAL PARAMONGA S.A.A.	FABRICA NACIONAL DE ACUMULADORES ETNA S.A.
AGRO PUCALA S.A.A.	FABRICA PERUANA ETERNIT S.A.
AGRO-INDUSTRIAS SAN JACINTO S.A.A.	FABRITEX PERUANA S.A.
ALICORP, SOCIEDAD ANONIMA	FERREYROS S.A.A.
ALMACENERA PERUANA DE COMERCIO S.A. - ALPECO	FILAMENTOS INDUSTRIALES S.A.
ASEA BROWN BOVERI S.A.	FIMA S.A.
AUSTRAL GROUP S.A.A.	GLORIA S.A.
BAKELITA Y ANEXOS S.A.	GRAÑA Y MONTERO S.A.A.
BAYER S.A.	GRUPO SINDICATO PESQUERO DEL PERU S.A.
BELLSOUTH PERU S.A.	HIDROSTAL S.A.
CARBOLAN S.A.	INCA TOPS S.A.
CASTROVIRREYNA COMPAÑIA MINERA S.A.	INDECO S.A.
CENTRAL AZUCARERA CHUCARAPI-PAMPA BLANCA S.A.	INDUSTRIA TEXTIL PIURA S.A.
CENTROS COMERCIALES DEL PERU S.A.	INDUSTRIAS ELECTRO QUIMICAS S.A. IEQSA
CIA. INDUSTRIAL NUEVO MUNDO S. A.	INDUSTRIAS VENCEDOR S.A.
COMPAÑIA CERVECERA DEL SUR DEL PERU S.A.A. CERVESUR	INTRADEVCO INDUSTRIAL S.A.
COMPAÑIA DE MINAS BUENAVENTURA S.A.A.	INVERSIONES CENTENARIO S.A.A.
COMPAÑIA GOOD YEAR DEL PERU S.A.	INVERSIONES EN TURISMO S.A. INVERTUR
COMPAÑIA INDUSTRIAL TEXTIL CREDISA - TRUTEX S.A.A. - CREDITEX	INVERSIONES NACIONALES DE TURISMO S.A. INTURSA
COMPAÑIA MANUFACTURERA DE VIDRIO DEL PERU LIMITADA S.A.	INVERSIONES PACASMAYO S.A.
COMPAÑIA MINERA ATACOCHA S.A.A.	IQF DEL PERU S.A.
COMPAÑIA MINERA CONDESTABLE S.A.A.	LAIVE S.A.
COMPAÑIA MINERA MILPO S.A.A.	LAPICES Y CONEXOS S.A. LAYCONSA
COMPAÑIA MINERA RAURA S.A.	LIMA CAUCHO S.A.
COMPAÑIA MINERA SAN IGNACIO DE MOROCOCHA S.A.	LP HOLDING
COMPAÑIA MINERA SANTA LUISA S.A.	LUZ DEL SUR S.A.A.
COMPAÑIA PERUANA DE ENVASES S.A.	MANUFACTURA DE METALES Y ALUMINIO "RECORD" S.A.
COMPAÑIA UNIVERSAL TEXTIL S.A.	MARMOLES Y GRANITOS S.A.
CONDUCTORES ELECTRICOS PERUANOS S.A. CEPER	METALURGICA PERUANA S.A. - MEPSA
CONSORCIO INDUSTRIAL DE AREQUIPA S.A.	MICHELL Y CIA. S.A.
CONSTRUCCIONES ELECTROMECANICAS DELCROSA S.A.	MINSUR S.A.
CORPORACION ACEROS AREQUIPA S.A.	MOTORES DIESEL ANDINOS S.A. - MODASA
CORPORACION CERAMICA S.A.	NEGOCIACION AGRICOLA VISTA ALEGRE S.A.
CORPORACION CERVESUR S.A.A.	NEGOCIOS E INMUEBLES S.A.
CORPORACION JOSE R. LINDLEY S.A.	NUEVAS INVERSIONES SA
DEL MAR S.A. Y SUBSIDIARIAS	PERU REAL ESTATE S.A.A.
DERIVADOS DEL MAIZ S.A.	PERUANA DE ENERGIA S.A.A.
DUKE ENERGY INTERNATIONAL EGENOR S.A.A.	PERUBAR S.A.
EDEGEL S.A.A.	PROMOTORA CLUB EMPRESARIAL S.A.
EDELNOR S.A.A.	QUIMPAC S.A.
ELECTRO SUR ESTE S.A.A.	REACTIVOS NACIONALES S.A. RENASA
ELECTRO SUR MEDIO S.A.A.	RED BICOLOR DE COMUNICACIONES S.A.A. - RBC TV S.A.A.
EMBOTELLADORA LATINOAMERICANA S.A. - ELSA	REFINERIA LA PAMPILLA S.A.A.
EMPRESA AGRARIA AZUCARERA ANDAHUASI S.A.A.	SAGA FALABELLA S.A.
EMPRESA AGRARIA CHIQUITOY S.A.	SHOUGANG GENERACION ELECTRICA S.A.A.
EMPRESA AGRICOLA BARRAZA S.A.	SHOUGANG HIERRO PERU S.A.A.
EMPRESA AGRICOLA GANADERA SALAMANCA S.A.A.	SOCIEDAD INDUSTRIAL DE ARTICULOS DE METAL S.A.C. - SIAM
EMPRESA AGRICOLA SAN JUAN S.A.A.	SOCIEDAD MINERA CORONA S.A.
EMPRESA AGRICOLA SINTUCO S.A.	SOCIEDAD MINERA EL BROCAL S.A.
EMPRESA AGROINDUSTRIAL LAREDO S.A.A.	SOUTHERN PERU COPPER CORPORATION, SUCURSAL DEL PERU
EMPRESA AGROINDUSTRIAL POMALCA	TABACALERA NACIONAL S.A.A. (Now British American Tobacco del Peru Holdings SAA)
EMPRESA AGROINDUSTRIAL TUMAN S.A.A.	TELEFONICA DEL PERU S.A.A. Y SUBSIDIARIAS
EMPRESA AZUCARERA "EL INGENIO" S.A.	TEXTIL SAN CRISTOBAL S.A.
EMPRESA DE LA SAL S.A.	TICINO DEL PERU S.A.
EMPRESA EDITORA EL COMERCIO S.A.	UNION DE CERVECERIAS PERUANAS BACKUS Y JOHNSTON S.A.A.
EMPRESA ELECTRICA DE PIURA S.A.	VIDRIOS INDUSTRIALES S.A. - VINSA
EMPRESA REGIONAL DE SERVICIO PUBLICO DE ELECTRICIDAD ELECTRONORTE MEDIO S.A. - Hidrandina	VOLCAN COMPAÑIA MINERA S.A.A.
EMPRESA SIDERURGICA DEL PERU S.A.A. - SIDERPERU	YURA S.A.
EXSA S.A.	

Table C2: Balance Sheet Data available by sector by year (Number of firms and percentage)

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Agribusiness	1	2	3	4	13	17	17	17	17	17	17	17	16	15	15	15	15	14	13	12
Commerce	11	14	15	15	16	17	17	17	17	17	17	17	17	16	15	13	13	12	12	11
Construction	3	5	5	6	6	6	6	8	8	8	8	8	8	8	8	8	8	8	8	8
Electricity	2	2	1	5	6	6	7	9	10	10	10	10	10	10	10	10	10	10	10	10
Fishing	1	1	2	2	2	3	4	4	4	4	4	4	3	3	2	1	1	1	1	1
Manufacturing	27	30	32	33	34	35	35	36	36	36	35	36	33	32	32	32	32	32	31	31
Mining	12	12	12	13	13	13	13	15	15	15	15	15	15	15	15	15	15	14	14	14
Services	3	3	4	5	6	7	8	9	9	9	9	9	9	9	8	8	8	8	8	8
Total	**60**	**69**	**74**	**83**	**96**	**104**	**107**	**115**	**116**	**116**	**115**	**116**	**111**	**108**	**105**	**102**	**102**	**99**	**97**	**95**

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Agribusiness	2%	3%	4%	5%	14%	16%	16%	15%	15%	15%	15%	15%	14%	14%	14%	15%	15%	14%	13%	13%
Commerce	18%	20%	20%	18%	17%	16%	16%	15%	15%	15%	15%	15%	15%	15%	14%	13%	13%	12%	12%	12%
Construction	5%	7%	7%	7%	6%	6%	6%	7%	7%	7%	7%	7%	7%	7%	8%	8%	8%	8%	8%	8%
Electricity	3%	3%	1%	6%	6%	6%	7%	8%	9%	9%	9%	9%	9%	9%	10%	10%	10%	10%	10%	11%
Fishing	2%	1%	3%	2%	2%	3%	4%	3%	3%	3%	3%	3%	3%	3%	2%	1%	1%	1%	1%	1%
Manufacturing	45%	43%	43%	40%	35%	34%	33%	31%	31%	31%	30%	31%	30%	30%	30%	31%	31%	32%	32%	33%
Mining	20%	17%	16%	16%	14%	13%	12%	13%	13%	13%	13%	13%	14%	14%	14%	15%	15%	14%	14%	15%
Services	5%	4%	5%	6%	6%	7%	7%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Table C3: Dollar Balance available by sector by year (Number of firms)

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Agribusiness	1	1	1	1	8	12	14	16	16	15	15	16	13	13	14	13	13	12	11	10
Commerce	10	13	15	15	15	16	17	17	17	17	17	17	17	16	15	13	13	12	11	11
Construction	3	5	5	5	6	6	6	8	8	8	8	8	8	8	8	8	8	8	8	8
Electricity	1	2	1	4	5	6	7	9	10	10	10	10	10	10	10	10	10	10	10	10
Fishing	1	1	1	2	2	3	4	4	4	4	4	4	3	3	2	1	1	1	1	1
Manufacturing	23	25	27	30	31	32	32	35	36	36	35	35	33	32	32	32	32	32	31	31
Mining	11	11	12	13	13	13	13	15	15	15	15	15	15	15	14	13	13	12	12	11
Services	3	3	4	5	6	7	8	9	9	9	9	9	9	9	8	8	8	8	8	8
Total	**53**	**61**	**66**	**75**	**86**	**95**	**101**	**113**	**115**	**114**	**113**	**114**	**108**	**106**	**103**	**98**	**98**	**95**	**92**	**90**

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Agribusiness	2%	2%	2%	1%	9%	13%	14%	14%	14%	13%	13%	14%	12%	12%	14%	13%	13%	13%	12%	11%
Commerce	19%	21%	23%	20%	17%	17%	17%	15%	15%	15%	15%	15%	16%	15%	15%	13%	13%	13%	12%	12%
Construction	6%	8%	8%	7%	7%	6%	6%	7%	7%	7%	7%	7%	7%	8%	8%	8%	8%	8%	9%	9%
Electricity	2%	3%	2%	5%	6%	6%	7%	8%	9%	9%	9%	9%	9%	9%	10%	10%	10%	11%	11%	11%
Fishing	2%	2%	2%	3%	2%	3%	4%	4%	3%	4%	4%	4%	3%	3%	2%	1%	1%	1%	1%	1%
Manufacturing	43%	41%	41%	40%	36%	34%	32%	31%	31%	32%	31%	31%	31%	30%	31%	33%	33%	34%	34%	34%
Mining	21%	18%	18%	17%	15%	14%	13%	13%	13%	13%	13%	13%	14%	14%	14%	13%	13%	13%	13%	12%
Services	6%	5%	6%	7%	7%	7%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	9%	9%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Table C4:Investments by sector (Thousands of nuevos soles) (constant prices base year 2005)

Values	Agribusiness	Commerce	Construction	Electricity	Fishing	Manufacturing	Mining	Services	Grand Total
Sum of 1991	1,317	159,828	131,348	122,763	8,650	223,112	289,495	13,830	950,343
Sum of 1992	7,556	322,958	260,330	191,216	30,031	347,712	389,448	16,982	1,566,235
Sum of 1993	25,235	579,149	198,045	127,947	44,333	589,673	569,331	40,560	2,174,273
Sum of 1994	191,926	1,292,024	378,124	2,490,275	57,964	875,496	1,189,000	1,901,411	8,376,221
Sum of 1995	1,209,646	2,085,576	540,805	4,463,280	94,705	1,051,648	1,691,816	3,622,947	14,760,424
Sum of 1996	2,021,203	2,822,804	800,420	6,199,851	501,772	1,405,410	1,980,857	5,832,810	21,565,129
Sum of 1997	2,142,775	3,201,837	1,074,500	6,690,728	678,768	1,717,351	2,286,523	7,312,709	25,105,190
Sum of 1998	2,417,506	3,810,250	2,403,672	8,079,056	1,683,941	2,986,004	3,151,583	8,873,126	33,405,138
Sum of 1999	2,627,374	3,921,360	2,705,326	8,861,466	1,685,698	3,187,263	3,869,816	9,957,376	36,815,678
Sum of 2000	2,648,970	4,397,971	2,189,892	9,388,043	1,758,049	3,203,100	4,224,151	10,062,806	37,872,981
Sum of 2001	3,013,909	4,023,390	2,034,487	9,149,665	1,747,148	3,052,648	4,419,631	7,907,511	35,348,389
Sum of 2002	3,104,787	3,813,810	1,923,902	9,250,102	1,663,239	3,089,709	4,364,386	8,190,449	35,400,384
Sum of 2003	3,117,545	3,990,113	2,080,702	9,439,349	1,476,671	3,028,463	4,503,718	7,701,904	35,338,466
Sum of 2004	2,808,682	4,052,871	2,049,528	9,876,755	1,446,125	3,129,688	5,196,806	7,495,992	36,056,448
Sum of 2005	2,912,263	3,656,441	1,970,502	9,866,283	1,310,992	3,092,216	6,404,986	6,774,837	35,988,521
Sum of 2006	2,871,382	3,069,029	2,172,091	10,821,350	537,297	2,883,637	7,006,872	6,245,132	35,606,791
Sum of 2007	2,997,544	3,428,710	2,573,460	10,621,652	566,491	3,067,864	8,552,137	5,784,173	37,592,032
Sum of 2008	3,018,686	3,961,467	3,382,672	11,067,047	661,740	3,273,814	10,405,210	7,252,834	43,023,470
Sum of 2009	2,769,426	4,390,616	4,375,619	11,501,811	639,818	3,178,797	11,355,976	7,405,555	45,617,618
Sum of 2010	2,817,629	4,908,132	5,119,197	11,639,647	565,067	3,417,192	12,633,993	7,543,773	48,644,630

Source: CONASEV, data manipulated by author

Table C5: Average Investment by sector (thousands of nuevos soles) (constant prices base year 2005)

YEAR	Agribusiness	Commerce	Construction	Electricity	Fishing	Manufacturing	Mining	Services	Grand Total
1991	1,317	14,530	43,783	61,381	8,650	8,263	24,125	4,610	166,659
1992	3,778	23,068	52,066	95,608	30,031	11,590	32,454	5,661	254,257
1993	8,412	38,610	39,609	127,947	22,167	18,427	47,444	10,140	312,755
1994	47,982	86,135	63,021	498,055	28,982	26,530	91,462	380,282	1,222,448
1995	93,050	130,348	90,134	743,880	47,353	30,931	130,140	603,825	1,869,660
1996	118,894	166,047	133,403	1,033,308	167,257	40,155	152,374	833,259	2,644,698
1997	126,046	188,343	179,083	955,818	169,692	49,067	175,886	914,089	2,758,025
1998	142,206	224,132	300,459	897,673	420,985	82,945	210,106	985,903	3,264,409
1999	154,551	230,668	338,166	886,147	421,424	88,535	257,988	1,106,375	3,483,854
2000	155,822	258,704	273,737	938,804	439,512	88,975	281,610	1,118,090	3,555,254
2001	177,289	236,670	254,311	914,967	436,787	87,219	294,642	878,612	3,280,496
2002	182,635	224,342	240,488	925,010	415,810	109,050	290,959	817,149	3,205,442
2003	194,847	234,713	260,088	943,935	492,224	121,044	300,248	748,437	3,295,534
2004	187,245	253,304	256,191	987,676	482,042	129,927	346,454	718,668	3,361,507
2005	194,151	243,763	246,313	986,628	655,496	126,566	426,999	727,117	3,607,033
2006	191,425	236,079	271,511	1,082,135	537,297	123,656	467,125	646,474	3,555,702
2007	199,836	263,747	321,682	1,062,165	566,491	129,568	570,142	588,233	3,701,865
2008	215,620	330,122	422,834	1,106,705	661,740	132,684	743,229	785,093	4,398,029
2009	213,033	365,885	546,952	1,150,181	639,818	129,860	811,141	819,838	4,676,707
2010	234,802	446,194	639,900	1,163,965	565,067	136,471	902,428	841,294	4,930,121

Source: CONASEV, data manipulated by author

Table C6: Foreign Currency Balances (Debt minus Asset) by sector (thousands of US dollars) (constant prices base year 2005)

Values	Agribusiness	Commerce	Construction	Electricity	Fishing	Manufacturing	Mining	Services	Grand Total
Sum of 1991	350	-6,350	5,194	-12,506	12,109	44,156	-10,512	-57,853	-25,411
Sum of 1992	-513	47,266	24,581	13,177	20,937	61,660	-6,155	28,661	189,613
Sum of 1993	76,697	69,570	-504	11,218	18,866	65,287	29,782	23,232	294,149
Sum of 1994	22,910	180,280	1,977	-7,542	25,164	105,305	10,164	-293,168	45,090
Sum of 1995	39,251	211,293	29,888	-58,972	27,969	193,311	-176,571	164,233	430,401
Sum of 1996	55,974	235,243	102,939	22,946	130,792	145,631	-199,289	376,495	870,731
Sum of 1997	83,620	516,870	184,212	166,089	324,861	144,166	-184,034	576,301	1,812,085
Sum of 1998	112,763	541,229	441,860	214,571	405,497	385,184	116,579	1,533,102	3,750,785
Sum of 1999	124,829	496,645	416,695	318,505	415,650	306,986	307,642	1,588,568	3,975,520
Sum of 2000	120,620	538,990	228,612	407,827	373,774	304,156	291,739	1,496,992	3,762,710
Sum of 2001	127,405	522,093	172,172	296,463	369,156	278,322	399,521	866,927	3,032,061
Sum of 2002	112,953	465,232	152,269	151,093	344,059	288,854	207,821	514,745	2,237,027
Sum of 2003	75,945	366,744	200,829	176,863	331,219	310,721	-57,261	464,755	1,869,816
Sum of 2004	88,326	450,587	180,746	179,416	277,197	359,584	-838,019	547,603	1,245,441
Sum of 2005	85,357	318,901	132,538	249,253	207,462	308,576	-752,875	117,491	666,703
Sum of 2006	83,967	268,060	126,608	404,660	83,566	380,139	-753,491	-331,802	261,706
Sum of 2007	87,483	428,318	136,650	272,841	97,719	365,029	-544,356	-47,393	796,292
Sum of 2008	110,332	557,740	448,236	490,749	109,793	882,379	-733,841	-175,763	1,689,625
Sum of 2009	92,772	333,358	439,470	482,810	73,807	520,895	26,352	-116,419	1,853,045
Sum of 2010	85,466	261,983	682,420	500,126	69,619	512,443	20,073	-54,971	2,077,159

Source: CONASEV, data manipulated by author

Table C7: Average Foreign Currency Balance (Debt minus Asset) by firm by sector (thousands of US dollars) (constant prices base year 2005)

Year	Agribusiness	Commerce	Construction	Electricity	Fishing	Manufacturing	Mining	Services	Grand Total
1991	350	-1,261	-17,695	-12,506	12,109	2,160	-956	388	-17,411
1992	-513	5,910	4,992	6,588	20,937	2,428	-560	-110	39,673
1993	134	10,603	-137	11,218	18,866	2,786	2,482	143	46,096
1994	-647	16,824	675	-1,885	12,582	3,922	782	-71,089	-38,837
1995	1,072	20,117	9,813	-11,794	13,984	6,472	-13,582	11,355	37,436
1996	2,901	16,873	21,598	3,824	43,597	4,958	-15,330	46,182	124,603
1997	3,379	33,647	37,719	23,727	81,215	5,137	-14,156	61,896	232,564
1998	3,744	36,650	61,085	23,841	101,374	11,595	7,772	159,634	405,694
1999	5,918	34,329	55,837	31,850	103,912	9,146	20,509	164,388	425,891
2000	6,769	35,403	31,401	40,783	93,443	9,108	19,449	156,321	392,678
2001	7,952	35,243	25,531	29,646	92,289	8,652	26,635	82,381	308,329
2002	6,887	30,396	22,885	15,109	86,015	12,224	13,855	32,909	220,281
2003	7,784	22,013	25,490	17,686	110,406	15,425	-3,817	25,625	220,613
2004	7,791	29,382	23,157	17,942	92,399	20,767	-55,868	22,850	158,420
2005	7,304	21,461	16,725	24,925	103,731	15,471	-53,777	-11,272	124,568
2006	6,956	19,896	15,295	40,466	83,566	6,281	-57,961	-18,180	96,318
2007	7,176	30,382	18,868	27,284	97,719	8,320	-41,874	8,082	155,957
2008	9,631	45,883	56,169	49,075	109,793	18,658	-61,153	13,795	241,849
2009	8,801	29,528	55,470	48,281	73,807	9,491	2,196	13,809	241,383
2010	9,078	23,643	86,457	50,013	69,619	10,466	1,825	15,047	266,147

Source: CONASEV, data manipulated by author

Table C8: Assets by sector (thousands of nuevos soles) (constant prices base year 2005)

Values	Agribusiness	Commerce	Construction	Electricity	Fishing	Manufacturing	Mining	Services	Grand Total
Sum of 1991	3,203	390,997	188,265	183,548	22,370	505,438	571,313	16,076	1,881,209
Sum of 1992	12,352	924,105	382,722	290,831	46,299	840,109	852,702	20,460	3,369,580
Sum of 1993	38,305	1,592,429	624,772	279,939	83,412	1,343,082	1,222,716	76,269	5,260,924
Sum of 1994	250,457	2,945,674	811,779	3,320,445	96,597	1,897,440	2,440,509	3,389,484	15,152,385
Sum of 1995	1,549,951	4,456,180	1,250,002	5,225,177	150,193	2,469,982	3,724,166	4,907,016	23,732,668
Sum of 1996	2,396,088	5,940,947	1,576,401	7,048,449	899,335	3,014,493	4,608,224	7,440,028	32,923,965
Sum of 1997	2,589,530	7,622,317	2,027,733	8,092,979	2,021,618	3,751,244	6,145,977	9,695,085	41,946,484
Sum of 1998	3,006,165	8,517,649	5,158,491	9,642,864	2,454,010	5,736,535	7,413,217	12,500,481	54,429,411
Sum of 1999	3,391,027	9,181,274	5,510,840	10,628,834	2,430,451	6,332,921	8,600,772	13,548,606	59,624,725
Sum of 2000	3,421,178	9,235,659	4,897,298	11,120,582	2,318,285	6,354,813	10,309,067	13,793,537	61,450,418
Sum of 2001	3,720,385	8,817,108	4,270,769	10,740,370	2,057,150	5,944,899	10,645,572	11,578,526	57,774,779
Sum of 2002	3,830,445	8,931,764	4,109,110	10,993,676	2,049,647	5,765,481	11,357,294	11,701,497	58,738,914
Sum of 2003	3,898,868	8,679,467	4,580,029	10,614,172	1,812,563	5,724,602	13,231,440	10,674,275	59,215,417
Sum of 2004	3,564,829	9,864,853	4,698,631	11,317,098	1,838,926	6,165,080	17,367,637	10,440,307	65,257,361
Sum of 2005	3,640,260	9,094,880	4,934,286	11,275,499	1,664,215	6,328,503	19,155,481	10,536,435	66,629,559
Sum of 2006	3,643,732	9,506,454	5,502,649	12,347,693	805,739	6,704,345	20,969,645	12,092,041	71,572,300
Sum of 2007	3,878,378	10,596,363	6,819,662	12,587,519	845,652	7,165,770	26,407,432	14,185,364	82,486,140
Sum of 2008	3,903,125	11,816,347	8,325,857	13,052,168	1,166,355	9,795,229	29,672,953	16,413,610	94,145,643
Sum of 2009	3,350,475	11,885,138	10,024,022	13,485,347	1,192,315	8,195,060	31,490,474	16,209,762	95,832,593
Sum of 2010	3,541,247	13,380,598	12,151,205	13,726,357	1,025,272	9,000,304	37,005,613	16,909,051	106,739,648

Table C9: Assets by sector (percentage)

Sector	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Agribusiness	0%	0%	1%	2%	7%	7%	6%	6%	6%	6%	6%	7%	7%	5%	5%	5%	5%	4%	3%	3%
Commerce	21%	27%	30%	19%	19%	18%	18%	16%	15%	15%	15%	15%	15%	15%	14%	13%	13%	13%	12%	13%
Construction	10%	11%	12%	5%	5%	5%	5%	9%	9%	8%	7%	7%	8%	7%	7%	8%	8%	9%	10%	11%
Electricity	10%	9%	5%	22%	22%	21%	19%	18%	18%	18%	19%	19%	18%	17%	17%	17%	15%	14%	14%	13%
Fishing	1%	1%	2%	1%	1%	3%	5%	5%	4%	4%	4%	3%	3%	3%	2%	1%	1%	1%	1%	1%
Manufacturing	27%	25%	26%	13%	10%	9%	9%	11%	11%	10%	10%	12%	12%	12%	13%	13%	13%	13%	11%	11%
Mining	30%	25%	23%	16%	16%	14%	15%	14%	14%	17%	18%	19%	22%	27%	29%	29%	32%	32%	33%	35%
Services	1%	1%	1%	22%	21%	23%	23%	23%	23%	22%	20%	17%	15%	13%	13%	13%	13%	14%	14%	13%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: CONASEV, data manipulated by author

Table:C10 Average Assets by firm by sector (thousands of nuevos soles) (constant prices base year 2005)

Values	Agribusiness	Commerce	Construction	Electricity	Fishing	Manufacturing	Mining	Services	Grand Total
Sum of 1991	3,203	390,997	188,265	183,548	22,370	505,438	571,313	16,076	1,881,209
Sum of 1992	12,352	924,105	382,722	290,831	46,299	840,109	852,702	20,460	3,369,580
Sum of 1993	38,305	1,592,429	624,772	279,939	83,412	1,343,082	1,222,716	76,269	5,260,924
Sum of 1994	250,457	2,945,674	811,779	3,320,445	96,597	1,897,440	2,440,509	3,389,484	15,152,385
Sum of 1995	1,549,951	4,456,180	1,250,002	5,225,177	150,193	2,469,982	3,724,166	4,907,016	23,732,668
Sum of 1996	2,396,088	5,940,947	1,576,401	7,048,449	899,335	3,014,493	4,608,224	7,440,028	32,923,965
Sum of 1997	2,589,530	7,622,317	2,027,733	8,092,979	2,021,618	3,751,244	6,145,977	9,695,085	41,946,484
Sum of 1998	3,006,165	8,517,649	5,158,491	9,642,864	2,454,010	5,736,535	7,413,217	12,500,481	54,429,411
Sum of 1999	3,391,027	9,181,274	5,510,840	10,628,834	2,430,451	6,332,921	8,600,772	13,548,606	59,624,725
Sum of 2000	3,421,178	9,235,659	4,897,298	11,120,582	2,318,285	6,354,813	10,309,067	13,793,537	61,450,418
Sum of 2001	3,720,385	8,817,108	4,270,769	10,740,370	2,057,150	5,944,899	10,645,572	11,578,526	57,774,779
Sum of 2002	3,830,445	8,931,764	4,109,110	10,993,676	2,049,647	5,765,481	11,357,294	11,701,497	58,738,914
Sum of 2003	3,898,868	8,679,467	4,580,029	10,614,172	1,812,563	5,724,602	13,231,440	10,674,275	59,215,417
Sum of 2004	3,564,829	9,864,853	4,698,631	11,317,098	1,838,926	6,165,080	17,367,637	10,440,307	65,257,361
Sum of 2005	3,640,260	9,094,880	4,934,286	11,275,499	1,664,215	6,328,503	19,155,481	10,536,435	66,629,559
Sum of 2006	3,643,732	9,506,454	5,502,649	12,347,693	805,739	6,704,345	20,969,645	12,092,041	71,572,300
Sum of 2007	3,878,378	10,596,363	6,819,662	12,587,519	845,652	7,165,770	26,407,432	14,185,364	82,486,140
Sum of 2008	3,903,125	11,816,347	8,325,857	13,052,168	1,166,355	9,795,229	29,672,953	16,413,610	94,145,643
Sum of 2009	3,350,475	11,885,138	10,024,022	13,485,347	1,192,315	8,195,060	31,490,474	16,209,762	95,832,593
Sum of 2010	3,541,247	13,380,598	12,151,205	13,726,357	1,025,272	9,000,304	37,005,613	16,909,051	106,739,648

Source: CONASEV, data manipulated by author

Table C11: Liabilities by sector (thousands of nuevos soles) (constant prices base year 2005)

Values	Agribusiness	Commerce	Construction	Electricity	Fishing	Manufacturing	Mining	Services	Grand Total
Sum of 1991	1,640	131,430	30,956	69,804	20,001	244,548	240,171	1,634	740,185
Sum of 1992	7,174	355,267	80,806	124,178	38,922	491,869	329,180	2,678	1,430,075
Sum of 1993	19,010	703,520	142,928	152,610	69,984	728,366	433,705	34,365	2,284,488
Sum of 1994	144,169	1,756,055	201,662	872,650	70,309	961,182	942,433	663,159	5,611,619
Sum of 1995	1,123,357	2,538,819	422,191	676,775	90,782	1,228,403	1,187,978	1,404,883	8,673,188
Sum of 1996	667,697	3,040,549	572,471	990,030	563,657	1,522,181	1,177,247	2,869,192	11,403,024
Sum of 1997	844,057	3,648,821	855,566	2,911,798	1,248,314	1,904,786	1,638,058	4,069,918	17,121,318
Sum of 1998	1,228,384	4,317,395	2,957,010	2,478,850	1,628,237	2,860,430	2,293,337	7,177,777	24,941,418
Sum of 1999	1,318,685	4,572,437	3,029,043	3,085,587	1,911,921	3,108,231	2,984,850	7,928,068	27,938,822
Sum of 2000	1,403,227	4,755,798	2,482,544	3,557,585	1,748,605	3,387,310	3,677,774	8,078,382	29,091,224
Sum of 2001	1,426,161	4,479,597	1,898,586	3,629,475	1,608,097	3,296,773	3,861,394	7,541,808	27,741,890
Sum of 2002	1,590,236	4,118,694	1,907,296	3,665,175	1,565,279	3,178,342	4,482,430	6,218,519	26,725,972
Sum of 2003	1,587,750	3,970,148	2,083,830	3,851,037	1,490,587	2,972,959	6,151,713	5,197,911	27,305,935
Sum of 2004	1,404,929	4,228,771	1,909,923	4,654,592	1,230,018	3,068,088	7,639,981	5,237,905	29,374,206
Sum of 2005	1,422,883	3,855,399	1,966,825	5,629,996	1,068,603	3,155,855	7,335,759	5,661,250	30,096,569
Sum of 2006	1,507,401	3,715,370	1,976,878	6,398,912	519,476	3,415,559	7,813,562	5,860,269	31,207,427
Sum of 2007	1,593,064	4,599,551	2,766,862	6,269,006	505,192	3,622,788	8,665,049	6,983,329	35,004,842
Sum of 2008	1,803,468	5,977,150	4,327,339	6,728,465	634,835	5,620,670	11,781,137	8,714,029	45,587,092
Sum of 2009	1,864,044	5,620,776	5,220,693	6,739,588	591,525	3,828,502	11,043,611	8,829,913	43,738,651
Sum of 2010	1,934,227	6,477,027	6,444,199	6,518,025	415,173	4,240,209	12,419,302	8,978,378	47,426,541

Source: CONASEV, data manipulated by author

Table C12: Average Liabilities by sector (thousands of nuevos soles) (constant prices base year 2005)

Year	Agribusiness	Commerce	Construction	Electricity	Fishing	Manufacturing	Mining	Services	Grand Total
1991	1,640	11,948	10,319	34,902	20,001	9,057	20,014	545	108,426
1992	3,587	25,376	16,161	62,089	38,922	16,396	27,432	893	190,856
1993	6,337	46,901	28,586	152,610	34,992	22,761	36,142	8,591	336,920
1994	36,042	117,070	33,610	174,530	35,155	29,127	72,495	132,632	630,661
1995	86,412	158,676	70,365	112,796	45,391	36,129	91,383	234,147	835,300
1996	39,276	178,856	95,412	165,005	187,886	43,491	90,557	409,885	1,210,368
1997	49,650	214,637	142,594	415,971	312,079	54,422	126,004	508,740	1,824,098
1998	72,258	253,964	369,626	275,428	407,059	79,456	152,889	797,531	2,408,212
1999	77,570	268,967	378,630	308,559	477,980	86,340	198,990	880,896	2,677,932
2000	82,543	279,753	310,318	355,758	437,151	94,092	245,185	897,598	2,702,398
2001	83,892	263,506	237,323	362,948	402,024	94,194	257,426	837,979	2,539,291
2002	93,543	242,276	238,412	366,518	391,320	111,268	243,675	782,869	2,377,958
2003	99,234	233,538	260,479	385,104	496,862	120,350	343,542	688,499	2,516,655
2004	93,662	264,298	238,740	465,459	410,006	135,427	424,960	722,610	2,614,542
2005	94,859	257,027	245,853	563,000	534,302	135,071	411,290	853,457	2,949,057
2006	100,493	285,798	247,110	639,891	519,476	159,805	407,692	944,807	3,092,798
2007	106,204	353,812	345,858	626,901	505,192	179,953	435,289	1,139,880	3,426,125
2008	128,819	498,096	540,917	672,846	634,835	240,639	692,953	1,349,227	4,498,360
2009	143,388	468,398	652,587	673,959	591,525	182,037	659,211	1,330,571	4,474,844
2010	161,186	588,821	805,525	651,802	415,173	203,668	738,987	1,381,483	4,687,458

Source: CONASEV, data manipulated by author

Table C13: Net profits by sector (thousands of nuevos soles) (constant prices base year 2005)

Values	Agribusiness	Commerce	Construction	Electricity	Fishing	Manufacturing	Mining	Services	Grand Total
Sum of 1991	-319	17,672	-16,803	7,676	-5,573	-46,057	-29,578	-1,744	-74,726
Sum of 1992	-716	73,482	5,530	13	-6,752	-40,279	80,897	-354	111,820
Sum of 1993	1,953	112,894	55,505	-9,807	-1,340	13,492	80,663	367	253,728
Sum of 1994	-17,375	156,342	100,306	114,881	12,501	46,459	386,980	94,625	894,719
Sum of 1995	-273,632	63,837	130,201	267,521	7,799	33,650	726,118	720,028	1,675,522
Sum of 1996	6,431	110,058	149,517	378,471	63,511	-21,517	596,506	944,490	2,227,467
Sum of 1997	-98,593	200,896	179,256	417,119	95,164	81,331	797,340	1,128,249	2,800,763
Sum of 1998	-296,728	7,472	274,167	403,439	-186,042	-147,365	294,820	416,583	766,346
Sum of 1999	-56,192	-17,072	95,424	437,086	-269,681	-148,818	373,131	567,500	981,378
Sum of 2000	-66,229	-9,879	118,674	502,823	-58,700	33,908	1,054,213	34,198	1,609,007
Sum of 2001	-16,061	126,236	92,162	467,619	-89,853	72,735	507,977	-265,650	895,164
Sum of 2002	-55,564	409,333	58,644	458,615	3,539	65,210	1,197,293	59,233	2,196,303
Sum of 2003	13,457	348,967	191,280	462,466	-120,059	90,082	1,318,155	48,957	2,353,305
Sum of 2004	39,728	473,354	222,930	443,507	228,091	238,711	3,813,711	32,104	5,492,135
Sum of 2005	15,954	467,305	291,532	549,718	-2,126	234,644	5,034,753	594,822	7,186,602
Sum of 2006	66,000	769,858	541,430	627,327	62,883	475,631	7,684,276	384,053	10,611,458
Sum of 2007	29,556	904,000	560,698	768,562	54,155	547,167	9,211,594	383,257	12,458,990
Sum of 2008	-78,040	1,043,005	644,774	546,770	30,242	559,846	6,127,742	427,684	9,302,022
Sum of 2009	19,193	1,206,107	711,410	910,726	71,447	77,504	5,646,580	1,125,234	9,768,201
Sum of 2010	142,710	1,341,724	1,002,985	919,094	43,056	420,761	8,938,453	1,211,045	14,019,828

Source: CONASEV, data manipulated by author

Table C14: Average net profits by firm by sector (thousands of nuevos soles) (constant prices base year 2005)

Year	Agribusiness	Commerce	Construction	Electricity	Fishing	Manufacturing	Mining	Services	Grand Total
1991	-319	1,607	-5,601	3,838	-5,573	-1,706	-2,465	-581	-10,800
1992	-358	5,249	1,106	6	-6,752	-1,343	6,741	-118	4,531
1993	651	7,526	11,101	-9,807	-670	422	6,722	92	16,036
1994	-4,344	10,423	16,718	22,976	6,251	1,408	29,768	18,925	102,124
1995	-21,049	3,990	21,700	44,587	3,899	990	55,855	120,005	229,977
1996	378	6,474	24,919	63,079	21,170	-615	45,885	134,927	296,218
1997	-5,800	11,817	29,876	59,588	23,791	2,324	61,334	141,031	323,962
1998	-17,455	440	34,271	44,827	-46,510	-4,093	19,655	46,287	77,420
1999	-3,305	-1,004	11,928	43,709	-67,420	-4,134	24,875	63,056	67,704
2000	-3,896	-581	14,834	50,282	-14,675	942	70,281	3,800	120,987
2001	-945	7,426	11,520	46,762	-22,463	2,078	33,865	-29,517	48,726
2002	-3,268	24,078	7,331	45,862	885	3,713	79,820	-1,024	157,395
2003	841	20,527	23,910	46,247	-40,020	3,311	87,877	3,307	146,001
2004	2,649	29,585	27,866	44,351	76,030	7,469	254,247	3,535	445,732
2005	1,064	31,154	36,442	54,972	-1,063	16,275	335,650	38,585	513,077
2006	4,400	59,220	67,679	62,733	62,883	18,292	512,285	34,294	821,785
2007	1,970	69,538	70,087	76,856	54,155	26,566	614,106	10,038	923,318
2008	-5,574	86,917	80,597	54,677	30,242	9,728	437,696	84,530	778,812
2009	1,476	100,509	88,926	91,073	71,447	7,076	403,327	122,922	886,756
2010	11,893	121,975	125,373	91,909	43,056	17,558	638,461	135,938	1,186,163

Source: CONASEV, data manipulated by author

Table C15:Fixed Investments by ownership by year (Thousands of nuevos soles) (constant prices base year 2005)

YEAR	Domestic Conglomerates	Foreign Ownership	Mixed Ownership	Private+ Domestic Ownership	Semi-Public	Total
1991	432,999	287,093	52,656	50,245	127,350	950,343
1992	821,938	372,680	94,293	79,184	198,139	1,566,235
1993	1,165,010	540,429	200,322	130,688	137,824	2,174,273
1994	2,201,730	4,952,679	544,481	153,572	523,759	8,376,221
1995	3,360,484	9,333,447	921,641	550,599	594,252	14,760,423
1996	5,046,138	13,446,688	1,473,698	824,356	774,249	21,565,129
1997	5,927,376	15,760,701	1,760,521	985,202	671,390	25,105,190
1998	9,114,552	20,055,361	1,994,960	1,142,905	1,097,361	33,405,138
1999	9,664,558	23,050,853	2,434,643	831,418	834,206	36,815,678
2000	9,972,403	23,645,583	2,582,608	792,675	879,712	37,872,981
2001	9,611,395	21,263,010	2,899,386	734,103	840,495	35,348,389
2002	9,192,545	21,658,971	2,942,252	749,742	856,873	35,400,384
2003	9,612,849	21,180,618	3,054,050	440,736	1,050,212	35,338,466
2004	9,724,110	21,613,744	3,306,835	468,497	943,262	36,056,448
2005	9,547,190	21,580,990	3,426,546	447,871	985,924	35,988,521
2006	8,172,379	21,979,709	3,778,358	426,145	1,250,201	35,606,791
2007	9,248,552	22,682,810	4,071,041	439,124	1,150,506	37,592,032
2008	12,022,709	24,862,669	4,393,645	426,023	1,318,425	43,023,470
2009	14,200,205	24,909,339	4,649,890	421,759	1,436,425	45,617,618
2010	15,913,354	25,240,372	5,467,674	422,941	1,600,289	48,644,630

Source: CONASEV, data manipulated by author

Table C16:Average Fixed Investments by firm by ownership (thousands of nuevos soles) (constant prices base year 2005)

YEAR	Domestic Conglomerates	Foreign Ownership	Mixed Ownership	Private+ Domestic Ownership	Semi-Public	Total
1991	18,826	14,355	10,531	5,583	42,450	91,745
1992	31,613	16,940	13,470	7,199	66,046	135,268
1993	44,808	23,497	20,032	10,053	68,912	167,302
1994	78,633	183,433	45,373	11,813	174,586	493,839
1995	105,015	301,079	57,603	39,329	198,084	701,109
1996	144,175	420,209	81,872	51,522	258,083	955,862
1997	169,354	463,550	92,659	61,575	223,797	1,010,934
1998	233,706	527,773	104,998	71,432	365,787	1,303,695
1999	261,204	548,830	128,139	55,428	278,069	1,271,670
2000	269,524	562,990	135,927	52,845	293,237	1,314,524
2001	266,983	506,262	152,599	48,940	280,165	1,254,950
2002	255,348	503,697	154,855	49,983	285,624	1,249,508
2003	267,024	504,300	160,739	40,067	350,071	1,322,201
2004	277,832	540,344	174,044	42,591	314,421	1,349,231
2005	280,800	553,359	180,345	40,716	492,962	1,548,181
2006	263,625	563,582	198,861	38,740	625,101	1,689,909
2007	308,285	567,070	214,265	39,920	575,253	1,704,794
2008	400,757	654,281	231,244	42,602	659,212	1,988,097
2009	473,340	691,926	244,731	42,176	718,212	2,170,385
2010	548,736	701,121	303,760	42,294	800,144	2,396,056

Source: CONASEV, data manipulated by author

Table C17: Foreign Currency Balances (Debt minus Asset) by ownership (thousands of US dollars) (constant prices base year 2005)

YEAR	Domestic Conglomerates	Foreign Ownership	Mixed Ownership	Private+ Domestic Ownership	Semi-Public	Total
1991	3,519	-68,550	26,197	27,452	-14,030	-25,411
1992	139,869	-19,210	24,821	31,402	12,731	189,613
1993	219,168	17,060	23,591	24,565	9,766	294,149
1994	274,992	-276,468	42,793	31,452	-27,679	45,090
1995	441,365	-103,359	54,502	75,363	-37,469	430,401
1996	594,437	250,447	-44,407	79,072	-8,819	870,731
1997	1,051,699	672,098	9,480	81,044	-2,236	1,812,085
1998	1,590,086	1,973,970	75,762	104,774	6,193	3,750,785
1999	1,419,160	2,317,720	144,521	88,629	5,490	3,975,520
2000	1,205,372	2,245,706	191,784	112,537	7,310	3,762,710
2001	1,292,902	1,448,387	184,977	99,679	6,116	3,032,061
2002	1,003,586	917,655	243,475	67,689	4,623	2,237,027
2003	834,866	811,946	183,266	39,610	127	1,869,816
2004	608,593	364,050	211,252	62,283	-737	1,245,441
2005	375,916	-3,932	231,707	61,085	1,926	666,703
2006	403,413	-225,524	30,639	52,580	598	261,706
2007	375,997	133,425	185,528	99,920	1,422	796,292
2008	829,576	790,387	-48,805	115,867	2,600	1,689,625
2009	725,676	827,618	228,022	71,179	551	1,853,045
2010	890,025	708,847	406,603	72,253	-569	2,077,159

Source: CONASEV, data manipulated by author

Table C18: Average Foreign Currency Balances (Debt minus Asset) by firm by ownership (thousands of US dollars) (constant prices base year 2005)

YEAR	Domestic Conglomerates	Foreign Ownership	Mixed Ownership	Private+ Domestic Ownership	Semi-Public	Total
1991	168	-3,808	6,549	3,432	-7,015	-675
1992	5,828	-960	4,137	3,140	4,244	16,388
1993	8,430	812	3,370	2,456	4,883	19,952
1994	10,577	-11,059	4,279	2,621	-13,839	-7,421
1995	15,763	-3,564	3,893	5,797	-18,735	3,154
1996	18,576	8,079	-2,960	5,648	-2,940	26,403
1997	30,932	20,367	593	5,403	-745	56,549
1998	40,771	51,947	4,209	6,985	2,064	105,976
1999	38,356	55,184	8,029	5,909	1,830	109,307
2000	32,578	53,469	11,281	7,502	2,437	107,267
2001	36,940	34,485	10,277	6,645	2,039	90,386
2002	27,877	21,849	12,814	4,835	1,541	68,917
2003	23,853	19,804	10,181	3,601	42	57,482
2004	17,900	9,101	11,736	5,662	-246	44,154
2005	11,391	-101	12,873	5,553	963	30,680
2006	13,447	-5,783	1,915	4,780	299	14,658
2007	12,965	3,336	11,595	9,084	711	37,691
2008	28,606	20,800	-3,050	11,587	1,300	59,242
2009	25,023	23,646	14,251	7,118	275	70,314
2010	31,787	20,253	27,107	7,225	-285	86,087

Source: CONASEV, data manipulated by author

Table C19: Assets by ownership (thousands of nuevos soles) (constant prices base year 2005)

YEAR	Domestic Conglomerates	Foreign Ownership	Mixed Ownership	Private+ Domestic Ownership	Semi-Public	Total
1991	850,241	592,311	113,193	121,824	203,640	1,881,209
1992	1,721,176	883,895	232,241	211,846	320,422	3,369,580
1993	2,801,491	1,336,894	447,024	367,096	308,419	5,260,924
1994	4,568,552	8,314,301	1,112,342	468,200	688,990	15,152,385
1995	6,903,856	13,160,596	1,899,438	981,689	787,028	23,732,608
1996	9,889,477	17,698,165	3,083,474	1,368,309	884,540	32,923,965
1997	11,934,210	23,510,480	4,004,201	1,654,570	843,022	41,946,484
1998	18,406,161	28,727,827	4,320,151	1,715,643	1,259,629	54,429,411
1999	19,864,089	31,819,550	5,544,379	1,403,449	993,258	59,624,725
2000	19,667,194	33,122,254	6,252,286	1,358,704	1,049,980	61,450,418
2001	18,380,169	30,353,077	6,811,297	1,246,853	983,383	57,774,779
2002	18,580,551	30,693,261	7,196,560	1,254,901	1,013,642	58,738,914
2003	19,024,248	30,000,829	8,238,569	926,298	1,025,472	59,215,417
2004	21,297,041	32,598,601	9,256,577	983,500	1,121,642	65,257,361
2005	21,365,256	32,970,233	10,119,302	1,037,553	1,137,214	66,629,559
2006	21,310,692	35,035,009	13,006,085	1,033,363	1,187,151	71,572,300
2007	25,111,506	39,917,059	14,920,128	1,198,149	1,339,298	82,486,140
2008	31,068,431	41,757,733	18,505,579	1,343,467	1,470,433	94,145,643
2009	33,113,618	41,644,779	18,148,587	1,277,594	1,648,013	95,832,593
2010	37,890,797	44,906,396	20,706,364	1,439,934	1,796,156	106,739,648

Source: CONASEV, data manipulated by author

Table C20:Average Assets by firm by ownership (thousands of nuevos soles) (constant prices base year 2005)

YEAR	Domestic Conglomerates	Foreign Ownership	Mixed Ownership	Private+ Domestic Ownership	Semi-Public	Total
1991	36,967	29,616	22,639	13,536	67,880	170,637
1992	66,199	40,177	33,177	19,259	106,807	265,620
1993	107,750	58,126	44,702	28,238	154,210	393,026
1994	163,163	307,937	92,695	36,015	229,663	829,473
1995	215,746	424,535	118,715	70,121	262,343	1,091,459
1996	282,556	553,068	171,304	85,519	294,847	1,387,294
1997	340,977	691,485	210,747	103,411	281,007	1,627,628
1998	471,953	755,995	227,376	107,228	419,876	1,982,429
1999	536,867	757,608	291,809	93,563	331,086	2,010,934
2000	531,546	788,625	329,068	90,580	349,993	2,089,812
2001	510,560	722,692	358,489	83,124	327,794	2,002,660
2002	516,126	713,797	378,766	83,660	337,881	2,030,230
2003	528,451	714,305	433,609	84,209	341,824	2,102,399
2004	608,487	814,965	487,188	89,409	373,881	2,373,930
2005	628,390	845,391	532,595	94,323	568,607	2,669,305
2006	687,442	898,334	684,531	93,942	593,576	2,957,824
2007	837,050	997,926	785,270	108,923	669,649	3,398,818
2008	1,035,614	1,098,888	973,978	134,347	735,217	3,978,043
2009	1,103,787	1,156,799	955,189	127,759	824,007	4,167,542
2010	1,306,579	1,247,400	1,150,354	143,993	898,078	4,746,404

Source: CONASEV, data manipulated by author

Table C21: Liabilities by ownership (thousands of nuevos soles) (constant prices base year 2005)

YEAR	Domestic Conglomerates	Foreign Ownership	Mixed Ownership	Private+ Domestic Ownership	Semi-Public	Total
1991	277,154	242,316	73,112	67,597	80,005	740,185
1992	666,764	362,428	134,050	127,806	139,028	1,430,075
1993	1,099,164	559,973	248,185	218,097	159,069	2,284,488
1994	2,137,705	2,426,235	623,535	265,632	158,513	5,611,619
1995	3,356,547	3,516,203	1,099,678	596,145	104,577	8,673,150
1996	4,638,377	4,906,544	1,019,346	640,975	197,781	11,403,024
1997	5,594,646	9,319,594	1,227,848	805,948	173,283	17,121,318
1998	9,408,894	12,667,063	1,448,689	1,033,985	382,787	24,941,418
1999	9,853,737	15,044,793	1,979,375	927,951	132,967	27,938,822
2000	9,760,226	15,967,328	2,255,814	983,180	124,675	29,091,224
2001	9,024,920	15,328,709	2,406,885	868,476	112,901	27,741,890
2002	8,661,921	14,569,569	2,477,392	886,468	130,622	26,725,972
2003	8,603,166	14,373,195	3,694,061	523,615	111,899	27,305,935
2004	9,035,360	15,781,486	3,879,641	551,194	126,525	29,374,206
2005	8,491,657	16,942,517	3,964,287	567,931	130,177	30,096,569
2006	8,007,300	18,355,246	4,147,997	547,476	149,409	31,207,427
2007	9,662,313	20,186,177	4,229,418	727,773	199,161	35,004,842
2008	15,027,531	22,959,270	6,591,336	788,277	220,678	45,587,092
2009	15,171,338	21,908,260	5,689,361	656,848	312,845	43,738,652
2010	17,055,338	23,216,962	6,099,304	734,381	320,556	47,426,541

Source: CONASEV, data manipulated by author

Table C22: Average Liabilities by firm by ownership (thousands of nuevos soles) (constant prices base year 2005)

YEAR	Domestic Conglomerates	Foreign Ownership	Mixed Ownership	Private+ Domestic Ownership	Semi-Public	Total
1991	12,050	12,116	14,622	7,511	26,668	72,968
1992	25,645	16,474	19,150	11,619	46,343	119,230
1993	42,276	24,347	24,819	16,777	79,535	187,752
1994	76,347	89,861	51,961	20,433	52,838	291,439
1995	104,892	113,426	68,730	42,582	34,859	364,489
1996	132,525	153,330	56,630	40,061	65,927	448,473
1997	159,847	274,106	64,624	50,372	57,761	606,709
1998	241,254	333,344	76,247	64,624	127,596	843,064
1999	266,317	358,209	104,178	61,863	44,322	834,890
2000	263,790	380,174	118,727	65,545	41,558	869,795
2001	250,692	364,969	126,678	57,898	37,634	837,872
2002	240,609	338,827	130,389	59,098	43,541	812,464
2003	238,977	342,219	194,424	47,601	37,300	860,521
2004	258,153	394,537	204,192	50,109	42,175	949,165
2005	249,755	434,424	208,647	51,630	65,089	1,009,543
2006	258,300	470,647	218,316	49,771	74,705	1,071,738
2007	322,077	504,654	222,601	66,161	99,581	1,215,074
2008	500,918	604,191	346,912	78,828	110,339	1,641,188
2009	505,711	608,563	299,440	65,685	156,423	1,635,822
2010	588,115	644,916	338,850	73,438	160,278	1,805,597

Source: CONASEV, data manipulated by author

Table C23: Net profits by ownership (thousands of nuevos soles) (constant prices base year 2005)

YEAR	Domestic Conglomerates	Foreign Ownership	Mixed Ownership	Private+ Domestic Ownership	Semi-Public	Total
1991	-31,521	-21,264	-11,290	-20,902	10,250	-74,726
1992	76,935	42,073	-1,979	-7,121	1,913	111,820
1993	164,970	102,588	-4,344	-1,202	-8,284	253,728
1994	341,619	491,254	32,631	20,050	9,166	894,719
1995	269,416	1,526,077	90	-124,137	4,073	1,675,520
1996	398,477	1,742,675	117,213	-26,520	-4,378	2,227,467
1997	574,672	2,119,067	135,752	-36,338	7,610	2,800,763
1998	352,791	728,497	-7,742	-252,675	-54,526	766,346
1999	174,267	697,329	181,731	-72,838	889	981,378
2000	427,235	744,524	398,744	17,054	21,451	1,609,007
2001	340,297	362,616	209,824	-9,999	-7,574	895,164
2002	1,033,079	832,917	328,319	-4,142	6,130	2,196,303
2003	976,783	954,081	366,547	43,174	12,720	2,353,305
2004	1,544,158	3,055,217	835,925	32,447	24,388	5,492,135
2005	1,409,235	4,577,487	1,123,831	53,720	22,329	7,186,602
2006	2,263,092	5,903,170	2,333,656	81,038	30,502	10,611,458
2007	2,853,074	6,726,419	2,674,279	162,838	42,380	12,458,990
2008	2,640,356	5,048,079	1,453,895	118,948	40,744	9,302,022
2009	2,606,374	4,360,144	2,643,837	105,527	52,318	9,768,201
2010	3,915,454	6,610,225	3,268,088	178,137	47,924	14,019,828

Source: CONASEV, data manipulated by author

Table C24: Average net profits by firm by ownership (thousands of nuevos soles) (constant prices base year 2005)

YEAR	Domestic Conglomerates	Foreign Ownership	Mixed Ownership	Private+ Domestic Ownership	Semi-Public	Total
1991	-1,370	-1,063	-2,258	-2,322	3,417	-3,597
1992	2,959	1,912	-283	-647	638	4,579
1993	6,345	4,460	-434	-92	-4,142	6,137
1994	12,201	18,195	2,719	1,542	3,055	37,712
1995	8,419	49,228	6	-8,867	1,358	50,144
1996	11,385	54,459	6,512	-1,658	-1,459	69,239
1997	16,419	62,325	7,145	-2,271	2,537	86,155
1998	9,046	19,171	-407	-15,792	-18,175	-6,158
1999	4,710	16,603	9,565	-4,856	296	26,318
2000	11,547	17,727	20,987	1,137	7,150	58,547
2001	9,453	8,634	11,043	-667	-2,525	25,939
2002	28,697	19,370	17,280	-276	2,043	67,114
2003	27,133	22,716	19,292	3,925	4,240	77,306
2004	44,119	76,380	43,996	2,950	8,129	175,574
2005	41,448	117,371	59,149	4,884	11,164	234,017
2006	73,003	151,363	122,824	7,367	15,251	369,808
2007	95,102	168,160	140,752	14,803	21,190	440,008
2008	88,012	132,844	76,521	11,895	20,372	329,644
2009	86,879	121,115	139,149	10,553	26,159	383,855
2010	135,016	183,617	181,560	17,814	23,962	541,969

Source: CONASEV, data manipulated by author